The British Journal of Educational Psychology

(Incorporating the "Forum of Education")

Volume XXIII
1953

Published by
METHUEN AND CO., LTD., 36, ESSEX STREET, STRAND, LONDON, W.C.2,
for the British Journal of Educational Psychology, Ltd.
Registered Offices: 42, Hill Street, Birmingham, 5.
on behalf of
THE BRITISH PSYCHOLOGICAL SOCIETY and THE ASSOCIATION OF TEACHERS IN COLLEGES AND DEPARTMENTS OF EDUCATION

VOLUME XXIII. FEBRUARY, 1953 PART 1

SYMPOSIUM ON PSYCHOLOGISTS AND PSYCHIATRISTS IN THE CHILD GUIDANCE SERVICE

VI.—RESEARCH IN CHILD GUIDANCE.

BY CHARLOTTE BANKS
(*Department of Psychology, University College, London*).

I.—*The need for research.* II.—*Psychology's alleged debt to psychiatry.* III.—*Summary and conclusions.*

I.—THE NEED FOR RESEARCH.

I HAVE been asked, as a university psychologist, to discuss the subject of research in child guidance. Research is of far greater importance than many workers in this field are inclined to suppose. Child guidance is an expensive service; and it is but natural that attention should be turned from time to time towards the efficacy of the methods it employs. On those questions which are usually held to fall within the province of the psychologist, a large amount of scientific investigation has already been carried out: much of it indeed goes back more than forty years, long before psychiatrists showed any active interest in the subject. It is scarcely necessary here to mention the immense amount of published material on the causes of backwardness, delinquency, and emotional instability, on methods of remedial teaching and training, on the reliability and validity of intelligence tests, of tests for educational attainments, and of devices for assessing personality; nor need I cite the numerous inquiries in which psychologists have followed up the after-histories of cases, to determine the practical efficiency of the various methods that have been tried. As a result, most of the psychological work at such centres now rests on a sound theoretical basis, with the exception, perhaps, of some of the semi-Freudian specific claims in reference to play-therapy.

But to-day a large part of child guidance is carried out by medically qualified psychiatrists, usually directors of the clinics, who make psychiatric diagnoses and carry out psychiatric treatment. Unfortunately, however, practically nothing has so far been published from which the accuracy of such diagnoses or the efficacy of such treatment can be assessed; and what little information is available is disappointing. In consequence, as Professor Kennedy implies, psychiatric treatment is still based on 'intelligent guesswork' rather than on scientific knowledge. When we consider the large numbers of children who have passed through psychiatrists' hands during the last twenty years—since the time when "child guidance became to a large extent an extension of child psychiatry"[1]—we cannot but regret that such rich opportunities for scientific study have been so neglected. There is little doubt that all members of a service which, like child guidance, derives its support from public money, must wish to increase the efficiency of their work. But how can this be done unless they submit their methods to scientific inquiry, in order that ineffective techniques may be eliminated, and the more promising gradually improved?

Why, then, has so little systematic research been undertaken on the problems of child psychiatry? The most obvious reason, though not necessarily

[1] Here I am quoting Dr. Moody's phrase (this *Journal*, XXII, p. 156).

the most important, is lack of time. Those who work in any applied field have only the evenings or week-ends in which to attempt research. If they have families, it is almost impossible for them to devote their spare time to study ; and even the unmarried need a high degree of scientific curiosity or personal ambition to sacrifice their leisure in this way. How many good students, who enter child guidance, manage to produce a thesis in under five or six years ? How many drop by the wayside, simply through pressure of the day's routine ?

Lack of time thus constitutes a genuine difficulty. This should not be underestimated by academic workers, who, in theory at least, have the whole of the long vacation to think and to implement their thoughts. However, the clinic worker has a remedy. If he has no time to conduct his own investigations, he can, if he wishes, co-operate with a full-time research worker in a university department or put his material at the disposal of some member of its staff. This is obviously a case where Professor Kennedy's principle of team-work might prove profitable, and where, in his phrase, there might be some " division of labour based on mutual respect."

This leads me to say how grateful my colleagues, my students, and I myself are to the child guidance clinics in London and elsewhere for the co-operation we have received. Many have gone out of their way to help us, and have afforded us facilities at much inconvenience to themselves. Yet, if I may quote Dr. Moody, too often " capacity for co-operation is more apparent than real." Frequently, the would-be research-worker finds that, in reply to a request to the medical director for permission to examine clinic records for purposes of research, unexpected difficulties are raised. The questionnaire, for example, which the research worker has designed to gather comparable data from a sample of records may be gratuitously criticized as ' too academic ' ; and he may be assured that many of the questions he has included are unnecessary and irrelevant, though he himself knows from the literature that they are essential to his research. After this mild rebuff, he may wait only to discover that his request remains unanswered, or in some instances is finally refused. This has been the experience of a number of departments of psychology.

These difficulties are worth emphasizing for two reasons. First, they seem to be indicative of an assumption, widely prevalent in child guidance, that research is unnecessary, and to be regarded with suspicion. How far this attitude is due to the psychiatrists and how far to the psychologists, it is hard to say. I do know, however, that several first-rate students of my acquaintance, on entering clinics, have been rapidly infected with a similar point of view, have quickly picked up a few hazy and ill-founded concepts which they accept without question, and, worse still, have lost all understanding of what constitutes scientific evidence. Instead of saying : " This is a difficult and unsolved problem calling urgently for research : how can the difficulties be resolved ? " they acquire an attitude which says, in effect : " These problems are beyond the reach of research, and any way, research is unnecessary."

Secondly, I have mentioned clinic records because experience shows that their contents have not been collected systematically for purposes of research and, therefore, are of only limited value for those pursuing a scientific inquiry. The accuracy and the extent of the information contained in them differ markedly, not only from clinic to clinic, but even from record to record within the same clinic. As a result, many of the comparisons essential to a rigorous analysis cannot validly be made. Naturally those who are busy working in the practical field are tempted to abridge their records as much as possible, simply to save time and trouble. Nevertheless, the research psychologist can hardly be blamed if he dreams of a day in the distant future, when records will be

compiled with an eye to the needs of scientific investigation. But who should be instrumental in bringing this about if not the directors of the clinics? And with whom are they to co-operate in such research if not with academic psychologists?

On the part of a psychologist, a disregard of the need for basic research would be inexcusable. It is, perhaps, more understandable in psychiatrists, almost all of whom are as untrained in scientific method applicable to psychology, as they are ignorant of general psychological literature. To say so is not to criticize, but merely to state a fact. Syllabuses for the various medical examinations—the Conjoint, the M.B., B.S., or the Diploma in Psychological Medicine—comprise no training for research in medicine, let alone in psychology. Moreover, psychological research has its own difficulties and pitfalls, which are unlikely to be avoided or even recognized by those who are unacquainted with the subject. And, although there are in this country some medically qualified psychiatrists who possess the requisite qualifications for post-graduate research in psychology, hardly any are in the child guidance service.

From this it seems safe to draw three conclusions. First, psychiatrists and psychologists who are actively employed in the child guidance service have little time for research. Secondly, the great majority of clinic directors are untrained in methods of research, and consequently would be incapable of planning a scientific investigation, even were the time available. Thirdly, they remain unconvinced of the need for scientific verification.[1] Having constantly to make quick decisions, they become, as Professor Kennedy says, " adept at forming impressions," and consequently find it hard to understand the outlook of the critical and analytic investigator who declines to accept any important conclusion until the evidence for it has been patiently sorted and sifted. If we add to these factual points the broad, good-humoured contempt that the practical worker feels for the ' mere theorist,' we have, I think, laid bare some of the main reasons why genuine research in child psychiatry is still almost non-existent, and why the theoretical study of child psychology and child guidance has suffered such a regrettable decline, since child guidance was virtually taken over by the medical profession. It is this decline in scientific work that has made some of the more far-sighted psychologists doubt the wisdom of psychiatric direction.

II.—PSYCHOLOGY'S ALLEGED DEBT TO PSYCHIATRY.

Now may I turn to one or two points raised by Dr. Moody in his contribution to this symposium. First, writing of psychologists, he says: " Because they have had success in removing symptoms—and who has not? . . . they have become over-confident in the efficacy of superficial methods of diagnosis and treatment indiscriminately applied, and too ready to dispose of the interest of psychiatrists in the deeper aspects of maladjustment as a morbid preoccupation with psychopathology." " This," he thinks, " has, at least in part, been responsible for psychiatrists' insistence on medical direction." Dr. Moody apparently is here confessing to an anxiety, common among psychiatrists, that, were psychologists to become directors of clinics, they would, in many cases, favour ' superficial methods ' and allocate to psychiatrists only the comparatively small number of children suffering from definite abnormality or serious maladjustment. But he quotes no instances of this. Moreover, psychiatrists publish no facts or figures to show that their preoccupation with the

[1] This point has been forcibly put by Dr. Alice Stewart (Director, Institute of Social Medicine, Oxford). " The majority of workers in this field," she writes, " seem not only to be unconvinced that statistics can be applied to psychological medicine, but about as resistant to conversion as most juvenile delinquents are determined not to be cured ! " (*Ninth Child Guidance Inter-clinic Conference*, N.A.M.H., 1952, p. 43.)

" deeper layers of maladjustment " is necessitated by the nature of the cases they have to deal with. Thus, we have nothing but the psychiatrist's personal opinion that the treatment he carries out is better than the psychologists', or, for that matter, that it is really effective. Psychiatric treatment in the child guidance clinic appears to be concerned primarily with unearthing buried emotional problems, and not at all with re-education or training. As the work of psychologists has shown, a sympathetic understanding and an unobtrusive inculcation of new interests and habits may, in many cases, prove quite effective, without any deeper probings.

Secondly, Dr. Moody emphasizes " the enormous debt that psychologists owe to psychiatry and psychoanalysis." Unfortunately, he gives no evidence to show how such a debt has been incurred ; nor does he cite references so that we may verify his meaning for ourselves. And, in point of fact, a rapid survey of the literature from the beginning of child guidance to the present-day will disclose no important discovery in the field of child guidance made first by the child psychiatrist and subsequently borrowed by the child psychologist.

Let us start in 1914, the year of the first appointment of an official psychologist by a local education authority. As Miss Keir has related in her article, the post was instituted because school medical officers were certifying too many children as mentally defective ; in consequence, there had been a marked increase in the number of children in special m.d. schools, and a corresponding increase in the cost of their education. The direct result of this first psychological appointment, and the work carried out on dull, backward, delinquent, and neurotic children, was that child guidance was officially recognized in this country.

But what was the psychologist's debt to psychiatry on taking up his work in 1914? Let us look at the textbooks of psychiatry current at the time : so far as they mention children at all, their chapters are confined almost exclusively to mental deficiency, and, indeed, chiefly to well-marked pathological types—Mongolians, microcephalics, cretins, hydrocephalics, and the like—which are, in fact, rarely seen either in schools or in child guidance clinics. Nor was current practice any better than current theory. To distinguish cases of certifiable mental defect from children who were merely dull and backward, the school medical officers and psychiatric consultants relied almost entirely on physical methods and physical symptoms—measuring the child's head, and inspecting him for stigmata and what were called ' nerve signs.' In consequence, as teachers constantly pointed out, more than half the children who were certified were brighter than the dullest who were left in the ordinary schools. As regards treatment, physical conceptions still predominated. To cure mental deficiency Sir Victor Horsley had introduced a surgical operation on the skull. He was as reluctant to give figures for his results as are psychiatrists to-day ; but later surgeons reported that the mortality was about one in four, and " those who survived revealed no improvement."[1]

Children showing extreme backwardness in reading were diagnosed as suffering from some form of ' congenital aphasia '—' congenital word-blindness,' ' congenital deafness,' or (as it was called later) ' congenital auditory imperception.' The teacher was told that, since the ' speech centre in the brain ' was innately defective, it would be impossible for such a child to learn to read. None of the psychiatric consultants who made such prognoses attempted to check them by teaching the child to read : usually he was simply certified and sent to a special school.

[1] TREDGOLD, A. F. : *Mental Deficiency* (1929), p. 401.

But Dr. Moody is doubtless thinking more of the psychoanalytic theories of abnormal mental processes which have played an increasing part in psychotherapeutic techniques. Here, however, it should be remembered that in England it was not psychiatrists who introduced psychoanalytic principles into child psychology, nor for that matter into the study of adults. It was psychologists, such as McDougall, Rivers, Flugel, Pear, Myers, and Burt, who were the first to draw the attention of serious workers to psychoanalytic theories and concepts, and who endeavoured, for a long time with little or no success, to interest the medical profession. This would not matter if the subsequent work of psychiatrists had made up for their delay in starting. But what contributions have been made by 'child psychiatrists' during the past fifteen or twenty years, that are not simply corollaries of the main principles enunciated by Freud and his contemporaries? And what theories have been put forward by any psychiatrist that have not been immediately repudiated by members of opposing schools of psychiatry?

The early psychoanalysts deduced their ideas about the course of emotional development in young children from observations of psycho-neurotic adults, with little or no attempt to verify their deductions by first-hand observations on children themselves. Nor was it the psychiatrists, in this country at any rate, who first applied psychoanalytic principles to the treatment of individual children.[1] If Dr. Moody turns to "The Dreams and Daydreams of a Delinquent Girl,"[2] he will find a systematic yet critical study of psychoanalytic principles as applied to an individual child; and he may, I think, be fairly asked to show what, in terms of well-verified theory, later psychiatrists have added to these earlier case studies.

Dr. Moody himself has acknowledged the ignorance of many psychiatrists who have taken up the work of child guidance. Naturally, any psychiatrist who describes the mental condition of young children must base his account on some kind of psychological theory. What the psychologist complains of is that his theories are either 30 to 50 years or more out of date or else consist in improvised speculations quite unchecked by factual evidence. Tredgold[3] writes in the twentieth century in terms of a doctrine of moral sense put forward by Shaftesbury in 1711, and included in no psychological textbook after 1800. Freud, except where he invents a terminology of his own, writes in the language of a hedonistic associationism that had already become out of date in this country before the close of the nineteenth century. Most other psychiatrists, even at the present time, still fall back on a faculty psychology that is half a century older than the Mills.

As for educational disabilities, Dr. Kerr and his followers adopt a doctrine of localized brain-centres which had already been rejected by William James and his contemporaries in 1890. Dr. William Moodie, the first Medical Director of the Child Guidance Council, assures us that psychiatrists are now paying "increasing attention to handicaps which influence ability to learn," and that "the most serious of these are colour-blindness, tone-deafness, and unusual combinations of lateral dominance of hand and eye." Backwardness in reading,

[1] As Dr. Anderson has pointed out (*ap.* CARMICHAEL, L.: *Manual of Child Psychology*, 1946, p. 35), the later books by Anna Freud (1925) and Melanie Klein (1932) contain nothing that amounts to objective verification; and each violently criticizes the views of the other.

[2] This *Journal*, VI, 1921, pp. 1-11, 66-74. For the method of treatment proposed in such cases, and its success, see BURT, C., "The Development and Training of the Emotions in Children," *School Hygiene*, VII, 1916, pp. 1-14, and *The Young Delinquent*, 1925, chaps. XII and XIII.

[3] *Mental Deficiency*, pp. 314f.

for example, he attributes, not (like his colleagues) to congenital defects of the related brain centres, but to a non-conformity between the centres for hand and eye : " by far the commonest finding is that the child is a ' crossed lateral ' ; he writes, shall we say, with his right hand, but his left eye is dominant." Needless to add, no statistical evidence whatever is offered for these surprising generalizations.[1]

One of the best and the most recent books on the subject is Dr. M. Barton Hall's *Psychiatric Examination of the School Child* (1947). Yet, her outline of mental processes requiring investigation is absurdly over-simplified, and hardly any of them is described in terms that are precisely defined. Take, for example, her account of the examination of children who are " backward in learning to read " (described in detail in the section on " Congenital Word-Blindness "). We are told that " the term *dyslexia* is appropriately reserved for these " (the word at once suggests a definite clinical entity—an attractive concept for the would-be psychiatrist, but a most unfortunate one for the child), and that " the distinction between word-blindness and dyslexia is mainly one of degree." Not every backward reader is a case of word-blindness, mild or severe : " the differential diagnosis rests between defective vision, feeblemindedness, and a personality or conduct disorder." This statement has been accepted by many school medical officers who base their methods on this book. As a result, in dealing with such cases (as the clinical files often show), the medical examiner infers that, when there are no signs of " a personality or conduct disorder," and when the child does not suffer from " feeblemindedness or defective vision," then he *must* be a hopeless case of congenital word-blindness. No investigation of the child's perceptual capacities, imagery, immediate and long-distance memory, cultural background, is ever attempted. The error here, of course, is the implicit claim that the cases referred to a clinic are medical cases, and must be interpreted in pathological terms ; else why would a medical director be needed ?

Apparently, for the same reason, there has been an attempt to reverse the conclusion of older psychiatrists that psychoses in childhood are rare. In a recent symposium it is stated that one case in every fifty seen in a child guidance centre is psychotic. What are the symptoms ? " Excitement, impulsiveness, causeless laughter," and " the personality ' falling to bits,' " above all, " the fundamental change to be concentrated on in diagnosis is that for these children the meaning of reality is different." This condition, it is said, can be recognized as early as 4 or 5. How the ' meaning of reality ' is to be discovered at that early stage is not explained ; and what child at that age will not display ' impulsiveness ' and ' excitement,' or sometimes laugh without apparent cause ? As Dr. Creak rightly observes, " looking at the problem of psychoses in childhood, it is difficult not to be daunted by the terminology in the now quite extensive literature. One of the symptoms . . . is singled out ; a new name is given ; and it almost seems as if a new disease had been described."[2]

The account of child guidance by psychiatrists in *Modern Trends in Psychological Medicine* undoubtedly shows a considerable advance.[3] An effort

[1] *Modern Trends in Psychological Medicine* (1948), pp. 186-7. Contrast this account of the causes of backwardness with the elaborate studies (supported by detailed case-histories and statistical tables) in *The Backward Child* (1935).

[2] " Psychoses of Childhood," *Proc. Roy. Soc. Med.*, XLV, 1952, pp. 796-802.

[3] Even here there are a few curious mistakes. Dr. W. Moodie declares that " the subject is comparatively new in Great Britain," and " started just before 1930." It was only later, so it appears, that " the psychiatrist called the educational psychologist to his aid." He ignores the fact that the London County Council did so in 1914. Most of the " new developments " which psychiatrists are said to be now introducing were urged by psychologists thirty years ago.

has evidently been made to incorporate the more important results of psychological research. Half the books and papers cited in the bibliography on child guidance are by psychologists. The dates for their work go back well before the appointment of medical directors; and thus confirm the statements made in Miss Keir's historical survey. In commenting on her paper, Dr. Moody declares that whether or not psychologists were "in temporal advance" of psychiatrists is "not of prime importance." But surely, if he is maintaining that psychologists are indebted to psychiatrists for their ideas, "without which the treatment of disturbed children would have remained in the wilderness," it is essential to show that in order of time the psychiatrists were first.

III.—SUMMARY AND CONCLUSIONS.

1.—There is an urgent need for research into the problems of child guidance. Even on the psychological side, the amount of such research has markedly declined during the last twenty years; and in child psychiatry practically no genuinely scientific investigations have been carried out at all. The main reason apparently is that many directors of clinics do not appreciate the importance of research as a basis for their practical work, and are loth to seek co-operation from those who have been trained in the requisite methods.

2.—The claim that "child guidance is new in this country" and that psychologists who entered that field were "enormously indebted" to the earlier work of psychiatrists is quite unjustified. As a review of the literature shows, the very idea of child guidance was due to psychologists; and the most important contributions were made by psychological investigators long before psychiatrists took up the work.

3.—The continued neglect of research has brought its inevitable consequences. Many teachers and educational officials have begun to doubt its value. No evidence is available to demonstrate the accuracy of the diagnoses or the value of the treatment. Psychiatrists still seek to explain the condition of each child in the light of pathological analogies, and their accounts are commonly couched in terms of doctrines which both teachers and psychologists know to have been long ago exploded. As a result, the practice of psychiatrists in the child guidance clinics still rests mainly on unverified speculation and what they themselves describe as "intelligent guesswork."

SYMPOSIUM ON PSYCHOLOGISTS AND PSYCHIATRISTS IN THE CHILD GUIDANCE SERVICE

VII.—Conclusion

By CYRIL BURT
(*Formerly Psychologist in the Education Department of the London County Council*)

I.—*The definition of psychology and psychiatry.* II.—*The problems of child guidance.* III.—*The training of psychiatrists and psychologists.* IV.—*The success of the psychological and the psychiatric approach.* V.—*Summary and conclusions.*

I.—The definition of psychology and psychiatry.

The Alleged Conflict between Psychologists and Psychiatrists.—The discussion on the functions of psychiatrists and psychologists in the field of child guidance has brought to light many instructive issues. But it is clearly still too early to sum up the results in the shape of agreed conclusions. The historical articles by Miss Keir and Dr. McCallum are useful statements of facts ; and are particularly valuable, because so many writers on child guidance have shown a lamentable ignorance of facts. Miss Davidson has given an impartial description of the actual work of clinical and educational psychologists. On the other hand, the papers by the two psychiatrists are avowedly controversial ; and it is evident that on many points their opinions diverge from each other as well as from those held by most psychologists.

On one all-important conclusion the six contributors seem unanimous, namely, that the help of both psychologists and psychiatrists is needed. It is in regard to the nature and extent of that help that the differences arise ; and here, tacitly or explicitly, every writer has acknowledged a sharp conflict of opinion. All seem eager to end it ; but, unfortunately, no one has indicated how precisely the differences can be reconciled.

Dr. Moody, however, has taken a most helpful step towards formulating the main points at issue. With a frankness that I shall try to imitate, he has endeavoured to lay bare what he takes to be " the source of the acute difficulties that have arisen between the two disciplines " ; and he quite rightly argues that " a clarification of spheres of function would greatly help to lessen the tension." " If," he says, " we approach the discussion on the basis of a more honest admission of the motives involved, we will eventually reach some agreement as to these proper spheres of functions, though not necessarily according to the formulations indicated by Professor Kennedy." To this Dr. Banks has replied that the issue is one which must be settled, not by discussing the motives of the psychologist or the psychiatrist, but rather by considering what is their special equipment in the way of scientific knowledge and specialized training, and how far this has actually enabled them to deal successfully with the practical problems that arise in the child guidance service.

In the early days of child guidance the chief difficulty was to secure agreement about the functions of the psychologist. Now it seems rather to

arise over the part to be played by the psychiatrist. As several medical writers have pointed out, " psychiatry at the present time is in a transitional state."[1] Perhaps for this reason both Professor Kennedy and Dr. Moody appear to have left their formulations vague. To begin with, we evidently need clearer definitions of the terms ' psychology ' and ' psychiatry,' as used in the course of the discussion. Secondly, we need a detailed statement of the varieties of work to be included under the phrase ' child guidance service,' more especially in regard to the kind of case and the type of problem with which the service is to deal. Thirdly, we must inquire how far the professional training of psychologists and of psychiatrists equips them to deal with this type of problem or that, and how far their efforts are attended with success.

The Definition of Psychiatry.—It is not easy to find an acceptable definition for the terms ' psychiatrist ' and ' psychiatry.' According to most dictionaries, whether medical or non-medical, psychiatry is " the diagnosis and treatment of mental diseases." But what are we to understand by mental disease? During most of the nineteenth century, the phrase was interpreted in a somewhat narrow sense, and taken to connote what we should nowadays call the psychoses. The work of Charcot, Janet, and their followers led to the explicit inclusion of the psychoneuroses, although several eminent psychiatrists have since contended that these " are not diseases in the medical sense at all."[2] Moreover, ' disease ' has for at least three centuries come to imply an *acquired* condition ; but psychiatry, like medicine generally, is usually taken to include within its scope *congenital* conditions, i.e., what are called ' defects ' (or at least certain kinds of defect). To cover all these various manifestations recent writers have adopted the more comprehensive phrase ' pathological conditions.' Accordingly, I myself would prefer to define psychiatry as " that branch of medicine which deals with the diagnosis, treatment, and prevention of pathological conditions of the mind." For brevity we may perhaps conveniently use the word ' illness' to cover both pathological disorders and pathological defects.[3]

In somatic medicine similar problems arise ; but they have caused less difficulty. A defect or disorder of height, weight, pulse-rate, temperature, or the like, is not in itself the concern of the doctor. To begin with, the disturbance must, as a rule, be both persistent and fairly well marked before he will take note of it. But secondly, it must also form part of a group or pattern of defects or disorders ; and this group or pattern of deviations almost always forms a qualitative rather than a merely quantitative deviation.[4] Some of the symptoms, considered separately, do no doubt, consist merely of extreme deviations in some characteristic that may show every degree of variation ; but the total condition in all its complexity presents a

[1] BLACKER, C. P. : *Neurosis and the Mental Health Services*, 1946, p. 16.

[2] E.g., JONES, E. : *The Treatment of the Neuroses*, 1920, p. 7.

[3] This appears to be the view adopted in what is still probably the best-known *Textbook of Psychiatry*, namely, that by Henderson and Gillespie : ' mental illness ' is regarded as the special subject matter (cf. p. viii), and what is covered by this phrase is set out in a classified scheme (p. 20) : it is to be noted that ' mental deficiency ' (of two main types—' emotional ' and ' intellectual ') is expressly included.

[4] As Shryock has pointed out (*The Development of Modern Medicine*, 1948, esp. pp. 22, 62), it was the great achievement of Sydenham in the seventeenth century, and of the Italian schools of the early eighteenth, to have exhibited " the difference between the merely abnormal and the definitely pathological." Previously the gradational doctrines developed from Galen's humoral pathology, which had treated disease as a quantitative variation along one or two main dimensions, had held the field. No doubt, the quasi-metaphysical conception of diseases as specific ' clinical entities,' correlated with localized lesions, had an unfortunate influence on early attempts at mental nosography.

difference in kind and not solely in degree. And the same, in my view, is true of mental defects and disorders.[1]

I am aware that a group of contemporary psychiatrists (and this includes many of those working in the British and American child guidance services) have recently attempted to re-interpret the term ' psychiatry ' in a wider sense. Hence, to forestall possible criticism, it is desirable to glance briefly at these alternative views. Several American writers, Dr. Haycroft, for example, propose to define psychiatry as ' the science of mental health.' But would they define general or somatic medicine as ' the science of physical health ' ? Is this not rather like defining warfare as the science of peace, or criminology as the science of virtue ? Were the term ' health ' used negatively to mean merely ' absence of illness,' I would gladly agree that mental health is an important concern of psychiatry. But many psychiatrists use it in the broader of the two senses given by most English dictionaries, namely, as covering all forms of ' mental well-being.' And on this basis they claim to be experts on a wide variety of subjects, ranging from vocational guidance and selection, industrial efficiency, and the selection of officers, to the ' general health of society '—in short (as one of them expresses it), " on the whole realm of personality." Others actually define the term as ' the general science of personality,' or, as Dr. H. S. Sullivan would phrase it, ' the study of interpersonal relations.'[2] Professor Masserman's interpretation is still more comprehensive : he and his followers call it the " science of behaviour,"[3] and this view is apparently adopted in a book published by the British Child Guidance Council, where we are told that " psychiatry " is concerned with " the essential mechanisms involved in *all* forms of behaviour, normal as well as abnormal," whereas psychology is concerned only with " the structure and operation of intelligence."[4]

It is only fair to add that the vast majority of psychiatrists are opposed to such extensions. Dr. Sargent and Dr. Slater, for example, consider it distinctly unfortunate that there should be " a tendency to-day for psychiatry to expand its field unduly, and for the psychiatrist to regard himself as a universal expert."[5]

How far would the contributors to this symposium agree with what may be called the more orthodox definition ? Dr. Moody would clearly favour a much broader interpretation. He quotes with manifest disapproval the common notion that " the psychiatrist is someone who is concerned with mental disease

[1] This view would be opposed by those modern psychiatrists who have revived what is sometimes called the ' gradation hypothesis,' namely, that the psychoses and psychoneuroses, together with individual differences within the normal range, form merely a single graded continuum. The evidence commonly adduced is based on a comparison of symptoms only. But this kind of argument would prove that the various fevers—chicken pox, scarlet fever, rheumatic fever, and the like—were merely manifestations, varying in severity, of the same underlying condition, and differing solely in degree from normal deviations of temperature, pulse-rate, etc. The chief difference between most physical diseases and most mental diseases arises from the fact that the former often have each only a single specific cause, the latter nearly always a multiplicity of causes. And a multiplicity of unanalysed causes nearly always produces a superficial appearance of continuity.

[2] *Psychiatry*, I, 1930, p. 121.

[3] MASSERMAN, J. H. : *Principles of Dynamic Psychiatry*, 1946. Cf. HARRIS, N. (ed.) *Psychological Trends in Modern Medicine*, 1948, p. 126. As exemplifying the wider interpretation, it may be noted that the latter volume treats such topics as ' personnel selection,' ' officer selection,' and the like, as sub-divisions of psychiatry, and at least one mental hospital has undertaken to construct tests for entrants to universities. There have been administrative reasons favouring this widened scope. During the war (as psychological members of the Advisory Committee will remember), it was often contended that, since psychology was a new and unknown subject, psychological innovations would meet less resistance within the various services if they were put forward under the sanction of the medical branch.

[4] *Child Guidance by Team Work*, by W. Moodie, General Secretary of the Child Guidance Council, 1931.

[5] SARGENT, W., and SLATER, ELIOT : *Physical Methods of Treatment in Psychiatry*, 1944, p. 164.

and psychopathology " ; and the suggestion that psychiatry deals specifically with ' pathological cases ' he dismisses as ' curious'. Professor Kennedy, on the other hand, apparently accepts the narrower and more usual view. He describes psychiatry as " that branch of medicine which deals with abnormal function of mind and brain." And for the purposes of the present discussion I myself should be quite prepared to adopt his definition at least in substance.

The wording of his definition, however, is by no means free from ambiguity. May I, therefore, propose one or two slight emendations, more by way of interpreting his meaning than with a view to criticizing it ?

The addition of the word ' brain ' is surely superfluous and even confusing. In his concluding remarks he implies that variations in mental function " must prove ultimately to be in terms of brain function." On this view all abnormal functions of the mind would necessarily be abnormal functions of the brain. Nevertheless, all abnormal functions of the brain are not necessarily associated with abnormal functions of the mind : and illnesses characterized solely by localized lesions of the brain are commonly regarded as a ' speciality ' of the neurologist. And in any case, even if, on metaphysical grounds, we hold that mental processes are nothing but brain processes, that hypothesis is neither helpful nor relevant when we come to practical treatment. To assure a teacher or a parent that a delinquent or unstable child is really suffering from a disordered function of the brain, would be most misleading. It is this materialistic assumption which in the past has been largely responsible for such measures as treating mental deficiency by operations on the brain or skull, and even to-day tempts many psychiatrists to suggest leucotomy, convulsive therapy, and other drastic methods of treatment instead of first trying simpler psychotherapeutic measures or what is sometimes called ' moral re-education.'[1] As Sherrington, our foremost neurologist, has repeatedly insisted : " Physiology has not enough to offer about the brain to lend the psychiatrist much help."[2]

But secondly, the word ' abnormal ' also needs an explanation. Professor Kennedy presumably adopts this term in order to include defects as well as diseases. Normal behaviour he apparently would identify with average behaviour ; and he would presumably agree with Dr. Miller who has told us that the psychiatrist is " concerned with deviations and their correction."[3] Yet, even so, there are difficulties. The average number of teeth is not the normal number of teeth ; and the psychiatrist is not concerned with *all* deviations from the average, but only with deviations of a certain gravity and in a certain direction (usually *below* the average, except perhaps in the case of emotional excitability). Telepathy and second sight are (according to most of those who believe in such processes) abnormal rather than normal ; but would Professor Kennedy regard them as falling within the province of psychiatry ?[4]

Whether or not I have interpreted Professor Kennedy correctly in regard to the details of his definition, on the main point his ruling seems clear. Psychiatry, he expressly says, is a " branch of medicine." And no one, I presume, will deny that medicine as such is concerned primarily with illness, not with giving advice or aid to those who are neither ill nor in any danger of becoming ill.

[1] Professor Kennedy even refers to the psychologist's ' application of measurement ' to the functions of discrimination, perception, speech, etc., as a ' clinical examination *of the nervous system.*' If we take this literally, then not only the teachers' tests of reading, writing, and arithmetic, but also junior county scholarship examinations and the like, would really be ' clinical examinations ' of functions of the pupils' nervous system.

[2] *Man on his Nature*, p. 283. Cf. also O. H. MOWRER, ap. 15, pp. 312f.

[3] Is Social Psychiatry Possible ? " *Brit. J. Med. Psych.*, XXIII, 1950, p. 213. Cf. also (8). I shall myself use the word ' normal ' as a convenient term for ' non-pathological.'

[4] On the other hand, Dr. Harris does apparently regard phenomena such as falling within the purview of the psychiatrist (*loc. cit. sup.*, p. 13) ; and Dr. Maberly tells us that " exceptionally good intelligence is as abnormal as defective intelligence, and neither is clinical " (i.e., " creates problems which may be regarded as pathological ") " unless associated with environmental circumstances making it so " (this *Journal*, XVI, p. 5).

The Definition of Psychology.—Psychology I should define as ' the science of mental life.' This makes it a branch of biology rather than of physiology—a point on which all British psychologists have, since the days of Darwin, Bain and Spencer, been in complete accord. There is, however, a regrettable ambiguity about the noun ' psychologist.' We have no convenient word to distinguish *applied psychology* from *general psychology*. In the field of ' somatology,' the theoretical and the practical spheres are designated by separate words : a man who studies *general* somatology is an anatomist or a physiologist, and a man who is concerned with *applied* somatology is called a physician or a surgeon.[1]

Now Professor Kennedy's remarks on the functions of the ' psychologist ' seem to overlook this double meaning. He tells us that " a degree in psychology is no evidence of competence to undertake the work of child guidance " ; and states that " a major criticism of the education of psychologists in this country is the extent to which different university departments specialize, so that the recent graduate is often either a social psychologist, an experimentalist, a very statistical one," etc. But the courses for the degree only profess to furnish the basic training, not the professional training. Such a degree no more guarantees ability to carry out work in any practical field than a degree in physiology qualifies a graduate to practise as a physician. Most of the departments which Professor Kennedy seems to have in mind—those, for instance, which are famous for their experimental work or for their training in the social field—do not pretend to train for child guidance. It is precisely for this reason that certain universities have instituted special post-graduate courses in industrial psychology, educational psychology, and the like.

Dr. Moody appears to make a similar mistake. " Professor Kennedy," he says, " has drawn an interesting comparison between psychology as a scientific discipline and psychiatry as a predominantly therapeutic one." But to contrast *general* psychology as a purely ' scientific discipline ' with psychiatry as an *applied* science is quite irrelevant to the problem at issue. What we have to compare is the *practical* post-graduate training of the *professional* psychologist ; and to this neither Professor Kennedy nor Dr. Moody refers.

II.—The problems of child guidance.

The Frequency of Psychological and Social Problems.—But, before we compare the training of the psychiatrist and the psychologist, let us first consider what are the problems with which both psychiatrists and psychologists will be called upon to deal in the field of child guidance. In its original sense—as used, for example, by Sully and his followers—the phrase ' child guidance ' included giving guidance to normal as well as to abnormal children, to the ordinary school pupil as well as to the ' difficult child.' Thus, many education authorities have required their child guidance expert to give advice and assistance on such questions as the allocation of pupils to appropriate types of secondary education, the conduct of examinations, tests, and interviews for junior county scholarships or the like, the institution of educational surveys, and the methods of teaching in special schools or classes. However, previous contributors to this symposium have taken the phrase child guidance mainly in the narrower sense. They have

[1] A similar difficulty arises with the word ' neurologist ' : a neurologist may be a theoretical scientist who investigates the general anatomy and physiology of the nervous system, or he may be a practitioner concerned with its organic diseases or disorders as found among individuals. French writers have tried to introduce the terms ' psychologue ' and ' psychagogue.' The British Psychological Society uses the phrase ' *professional* psychologist ' to describe the qualified practitioner in the field of applied psychology.

for the most part limited the discussion to that special type of work which is carried out at what used to be termed ' psychological centres ' and are now more frequently called ' child guidance clinics,' in short, what Professor Kennedy (p. 170) terms ' clinical psychology.'[1]

What then are the types of case commonly referred for child guidance? No doubt they vary somewhat from one centre to another. But, if we can trust their annual reports, nearly half the cases consist of children who are dull, backward, or suffering from some special educational disability; about a quarter are classified as ' behaviour difficulties '—chiefly petty delinquency; and the rest consist of cases of emotional disturbance or various forms of maladjustment.[2] If we may judge by surveys such as those carried out by the Sheffield Education Authority, 80 to 90 per cent. are non-pathological. As the descriptions indicate, the commonest problems are essentially psychological or social, not physical or medical. Descriptions suggestive of physical or organic disturbance, or implying definite illness, mental or bodily, are comparatively rare.

The Rarity of Physical Conditions.—Professor Kennedy complains that educational psychologists " minimize the importance of physical factors."[3] But how often does a ' physical factor ' constitute the main cause of backwardness, delinquency, or emotional disturbance? A reference to more detailed tables for clinic cases and control groups will quickly show that definite physical conditions are not much commoner in children referred on mental grounds than they are in other children drawn from the same social class. When present, such physical conditions will probably be detected and dealt with by the ordinary school medical service rather than by the psychiatrist as such. As a result, cases in which some organic defect plays an important part are seldom seen at the clinic. I have had occasion to examine a large number of case-reports from various centres in London and elsewhere; and I have always been struck by the

[1] In passing I venture to deprecate the use of the word ' clinical ' in this sense, convenient though it is. Miss Davidson insists on the need for a common language. But many junior psychologists seem to think that this common language should be medical language. They refer to themselves as ' clinical ' psychologists, talk of ' diagnosing ' the condition of their ' patients,' of studying ' symptoms ' and their ' etiology,' of making a ' prognosis,' and of carrying out ' therapeutic ' treatment. It is this that justifies the complaints of medical writers like Dr. Moody, who tell us that " the psychologist wants to be a psychiatrist, as far as he dare," and, therefore, tries to compensate for a sense of inferiority by borrowing the professional jargon of the doctor. Strictly speaking, ' clinical ' examinations and ' clinical ' treatment are examinations and treatment carried out from the bedside, and imply examinations and treatment of a person considered in isolation from his environment. That may be adequate in dealing with bronchitis or a broken rib. But with mental disturbances the investigation must be as much environmental as personal, and the treatment may be wholly environmental. These medical metaphors (for in the context they are nothing more) inevitably suggest to the parent, the teacher, and the general public that the appropriate approach is that of the doctor treating a ' case ' in the hospital or the surgery, whereas what the psychologist has to deal with is nearly always a situation rather than a patient.

[2] The figures cited in the recent N. A. M. H. Report (17, pp. 55-6) seem a little misleading. E.g., those sent in by the Birmingham clinic state that only 18·6 per cent. of the cases investigated had I.Q.s below 90 (p. 71); actually, the totals at the same clinic for the years 1944-1951 (not cited in the N.A.M.H. Report) show that 935 out of 1,925, i.e., 48·6 per cent., had I.Q.s below 90, and still more were ' backward ' without being ' dull.' The seven clinics, whose figures are analysed in the N.A.M.H. Report, enumerated only five cases of ' backwardness ' or ' scholastic difficulty ' between them!

[3] It was the supposed importance of these physical or organic factors that led to the insistence, in the earlier clinics, on the need for a medical director. This argument now seems to have been dropped by most writers. According to the N.A.M.H. Report only one clinic refers to ' physical disorders ' (two cases): cf. 17, pp. 55, 58.

fact that the psychiatrists' reports make very little reference to physical factors, even in those rarer cases in which they actually contribute to the disturbance. Nowadays, the psychiatrist is far more apt to note and stress the influence of psychogenic factors. Curiously enough, judging from the numerous case-histories I have seen, it is more frequently the psychologist than the psychiatrist who unearths a story of encephalitis in early years, or draws attention to the presence of intermittent deafness following measles or of astigmatism uncorrected by spectacles, or suggests the need for a physical examination.

The Rarity of Pathological Conditions.—Even psychiatrists are now agreed that mental diseases of the type that bulk so largely in the ordinary textbook of psychiatry are extremely rare among children of school age.[1] In children the conditions most frequently described as ' mental illnesses ' are those vaguely designated ' psychoneurotic ' ; and even these, in a large majority of instances, display little or nothing of the marked pathological features that characterize definite psychoneuroses as encountered among adults. Judging by the numerous cases that have passed through my hands, in quite half of those in which the child is referred to as ' mentally ill,' the main source of the trouble is to be found, not in the child himself, but in the conditions of his home or school.

The Frequency of Maladjustment.—It was for this reason that Sully was never tired of pointing out that many of the children diagnosed as mentally ill or mentally defective were really cases of maladjustment. Adjustment and maladjustment imply the interaction of two factors, namely, the child's personality and the particular social environment into which he is expected to fit. Among the cases ordinarily referred to child guidance clinics, over 70 per cent. involve maladjustment in some form or degree; and in more than 30 per cent. some environmental handicap appears to be the major factor.[2] Most psychologists and many teachers, I fancy, could quote numerous examples where the child has been treated for six months or more by psycho-analytic or other psychotherapeutic measures with little or no improvement ; and yet, once a change of school of or home conditions has been effected, the trouble has cleared up almost immediately. Of late, many psychiatrists have become increasingly alive to the preponderant importance of environmental influences, both in the home and in the school. But it is extremely puzzling to know why it needs a medical training to discover and deal with what is essentially a social or educational condition.

III.—The Training of Psychiatrists and Psychologists.

The Need for Appropriate Training.—All who have contributed to this discussion have emphasized that, if the work of the psychologist and the psychiatrist is to be effective, each should concentrate on those particular tasks

[1] One or two writers have recently maintained that psychiatrists in the past have overlooked the occurrence of psychoses during childhood (16 and refs.). But, as Dr. Banks points out, they do not appear to have convinced the majority of their colleagues.

[2] The apparent reason is that most psychiatrists still treat ' maladjustment ' as a ' disability of the mind ' (e.g., 11, p. 335), and therefore in practice assume it can be adequately investigated by simply examining the child and reading reports, without visiting either home or school. However, the Act of 1944 now includes ' maladjusted children ' among the main categories of ' handicapped children ' ; and this may lead to a more direct study of the problem. (Cf. also 14.)

for which he has been specifically trained. Dr. Moody, indeed, frankly states that the main cause of the conflict has been the fact that, in so many child guidance clinics, psychiatrists with no appropriate training have been appointed to senior posts which require them to direct the work of psychologists who have been appropriately trained. Consequently, he says, " in their ignorance and insecurity, they have become ineffectual or autocratic . . . Where each has been trained in his speciality, there will be mutual respect." Such appointments had further effects to which Miss Keir has drawn attention. Finding that there was little hope of obtaining a directorship in the field of child guidance, unless they had secured a medical qualification, the ablest students who were attracted to psychology turned to other branches ; and, since by the recognized scales the salaries in the medical profession were much higher than those offered to workers without medical qualifications, the cost of the child guidance services rapidly increased.

However, the real points at issue seem to be these. How far does the training received by psychologists and psychiatrists equip them to deal with the types of problem encountered in the child guidance service ? And, since the training is so different, what are the differences in the kinds of work which psychiatrists and psychologists respectively may be expected to undertake with success ?

The Training of Psychiatrists.—The indispensable part of the psychiatrist's training consists in the general training which is required for all medical students before they can be regarded as fully qualified medical practitioners.

This includes (in addition to the science courses requisite for the ' first examination ') anatomy, physiology, pathology, medicine, surgery, pharmacology, and therapeutics, obstetrics, and gynæcology, hygiene, and forensic medicine. The whole course demands at least five years' full-time study. After qualification, the student is required by the Act of 1950 to spend a prescribed period (in general, twelve months) in a resident appointment at an approved hospital or institution.

To qualify for specialist status in any of the older branches of medicine, it is generally considered essential that the physician should possess either a higher medical degree of a university (i.e., a doctorate) or a higher qualification of one of the Royal Medical Colleges (e.g., a Fellowship of the Royal College of Physicians) ; the University of London, for example, awards the degree of M.D. in ' Branch III ' (' Psychological Medicine ') after examination. But comparatively few psychiatrists sit for any such examination. Those who seek for any formal qualification are more usually content to take the Diploma in Psychological Medicine, which cannot claim even to approach the standard that is required for specialists in other branches of medicine. As the *Report of the Interdepartmental Committee on Medical Schools* remarks in its discussion of the qualifications of psychiatrists : " Although various bodies award post-graduate diplomas in psychological medicine, the standard varies, but is generally low : in most cases the clinical requirements can be met in six months spent at almost any mental hospital." In consequence, many of these diplomas, it believes, merely " encourage ill-grounded and immature specialization " (*loc. cit.*, pp. 186-7). Moreover, quite apart from the low standard, the content of the syllabuses and the training is not directed towards the study and treatment of such cases and such problems as are encountered at the child guidance clinics.[1] The approach throughout is medical rather than psychological, and is concerned chiefly with the diagnosis and treatment of the graver forms of mental disease or

[1] E.g., when the M.D. in Branch III is taken by written examination, the candidate sits for four papers—neurology, psychology, mental diseases, and mental deficiency. It will be observed that those who framed these and other relevant regulations were far from accepting the extremely wide view of the subject which, as we have seen, several psychiatrists have attempted to advocate.

deficiency, such as are encountered at the mental hospitals (or ' asylums ' as the general public is still unfortunately accustomed to describe them).[1]

Psychiatry differs from other specialized branches of medicine or surgery—for example, gynæcology—in that it is quite common for a physician to be regarded as a psychiatric specialist, without taking any specialized course or examination whatever. It is open to any medical man, if he wishes, to set up as a psychiatric consultant. Thus, a Director of a child guidance clinic may have no degree whatever (merely the conjoint qualifications, for example, though he will be called ' Doctor '), and may direct the work of a psychologist who has actually secured a doctorate. " If," says the Inderdepartmental Committee, " psychiatry is to acquire the same status as other branches of Medicine, and the right kind of practitioner is to be engaged in it, psychiatrists must be included in any arrangements that may be made for the recognition of specialists ; and the post-graduate training and experience must be comparable with the requirements for specialists in other branches." Professor Valentine puts the matter still more strongly : " Perhaps the greatest danger of all is that of incompetence and even charlatanism in the field of mental health " (12, p. 142).

Dr. Moody frankly recognizes these criticisms. " The medical profession," he says, " emerges from this muddled situation with no little blame attached to itself. By claiming child guidance as a branch of medicine, it incurred obligations that it had not at that time the trained personnel to carry out. They had to rely upon the public esteem and confidence vested in their profession rather than on a sound knowledge." Why, then, does he still support the view that psychiatrists should not only take the principal share in the work of child guidance, but actually direct it ? " One's experience," he says, " has been that many psychologists in the child guidance service, through familiarity with everyday problems of school children, have become over-confident on the efficacy of superficial methods of diagnosis and treatment . . This has been at least in part responsible for the psychiatrist's insistence on medical direction of clinics where possible."

But surely this is scarcely a cogent reason. Even if, as a result of special training and experience, the psychologist's confidence has become excessive, is that a ground for appointing a medical director whose training and experience, in this particular field, have been far more limited ? Does that not imply a still greater " over-confidence " on the part of the psychiatrist ? Could not the psychologist adapt the argument, and retort that it is the over-confidence of the untrained psychiatrist that has been, at least in part, responsible for the psychologist's insistence on psychological direction ? Perhaps by way of forestalling such a reply, Dr. Moody suggests that it will be desirable in the future to ensure that " the psychiatrists employed in these clinics have all been trained in *child* psychiatry " (his italics). He does not say what is covered by the phrase ' child psychiatry,' nor who is to give such training or examine the trainees. Nor does he explain how it has happened (supposing his claims to be well based) that

[1] Some of the child guidance clinics offer short courses of training for medical men seeking to qualify for this work, but, as its critics have observed, it leads to no authoritative examination or qualification, and frequently those who give the training are themselves untrained, and have little or no experience in the training of students. Professor Kennedy himself has noted how each psychiatrist is apt to interpret his problems in terms of " one system of thought," and " neglect the advantages of an eclectic approach." For fuller information and criticisms on these points, see again the Goodenough *Report* and (10), especially Chapter VI, " Training of Psychiatrists." Recently some attempt has been made to meet these deficiencies : e.g., in London the Maudsley Hospital has been approved for recognition as a Federated Institute of the British Postgraduate Medical Federation, with the title of the Institute of Psychiatry, and has been amalgamated with the Bethlem Royal Hospital as a joint Teaching Hospital under the National Health Service Act.

child psychiatry did not long ago[1] form a definite branch of psychiatric training. The real explanation seems to be indicated by the comments of Dr. McCallum and Miss Keir. As we have already seen, typical mental disorders, such as are rightly recognized as forming the main concern of the psychiatrist, are extremely rare during childhood : most of the difficulties for which children of school age are referred to child guidance centres are difficulties with which teachers and psychologists have been dealing for at least half a century. Further, as Dr. Banks points out, it is the psychologists, not the psychiatrists, who have carried out systematic investigations into the causes and the most effective types of treatment. Presumably, therefore, so far as scientific[2] knowledge is concerned, child psychiatry will have mainly to consist in instructing members of the medical profession about the results achieved by psychologists in their researches and the methods which psychologists have developed for such cases, in short, in giving them the training in guidance work that psychologists have been giving in psychological departments, with increasing knowledge and first-hand detail, for more than forty years.

The Training of the Psychologist.—Miss Keir (p. 25) and Dr. McCallum (p. 86) have briefly indicated the general nature of the training received by the psychologist. But the criticisms of both Dr. Moody and Professor Kennedy suggest that fuller details are requisite to remove some of the misunderstandings on which their comments are evidently based. Professor Kennedy believes that, as a result of the training they receive, psychologists, confronted with a 'diagnostic situation,' tend "by habit to limit the number of variables and reduce these to terms of measurement."

Certainly, psychologists in their researches on delinquency and other problems have regularly sought to measure the relative importance of the 'variables' in the groups they study, and in treating individual cases they apply standardized tests as a matter of routine. But, if Dr. Kennedy will glance again at the tables in (say) *The Young Delinquent* or *The Backward Child*, he will find that "the number of variables" is not *more* limited than those enumerated by medical writers ; and, if he turns to the case histories, he will see that test measurements form a very small fraction of the total report.[3] It is, in fact,

[1] As Miss Keir points out, Henderson and Gillespie's *Textbook on Psychiatry* contained no chapter on "the psychiatry of childhood" until it had reached a third edition. Previously almost the only references to childhood echoed the remarks of the standard textbooks, namely, that "mental disorder is very rare in children" (cf., for example, Stoddart's textbook, *Mind and its Disorders*, 1918, p. 181).

[2] No doubt, as one may gather from current courses, there will be a large amount of unscientific speculation, dogmatically propounded, and conceived more or less on the lines of some particular type of psychoanalytic or psychotherapeutic doctrine. As Professor Kennedy acknowledges, psychiatrists "tend to interpret their cases in terms of one system of thought, and neglect the advantages of an eclectic approach," and, one may add, of keeping closely to causal principles that have been adequately verified by scientific research.

It may be noted that many of the modifications which Dr. Moodie (ap. 13) tells us have been recently introduced into child psychiatry were advocated by psychologists thirty years ago (cf. 3, 4, 5).

[3] The assumption made by Professor Kennedy and most other psychiatrists (e.g., Dr. Maberley, this *Journal*, XVI, p. 6) that, *because* a psychologist tries to measure those variables that are quantitative, *therefore* he is bound to ignore those that are not quantitative, is an assumption which is in flat contradiction with the evidence, and yet one which it seems impossible to quash. Everyone who attempts to train young psychologists in the use of tests always insists that "tests are but the beginning, never the end, of the examination." (*Mental and Scholastic Tests*, 1921, p. xv.) The psychologist may comfort himself by reflecting that the medical man's habitual aversion to tests and measurements has not been directed exclusively against those of the psychologist. Galileo, in 1620, proposed measuring pulse-rate and temperature ; Leeuwenhoek, in 1683, counting bacteria ; Stephen Hale, in 1733, measuring blood pressure. Yet for centuries such devices were ridiculed by medical practitioners, and only came into regular use during the second half of the nineteenth century.

not the psychologist but the psychiatrist who " tends by habit to limit the number of variables," and thus reduces them (as Professor Kennedy elsewhere admits) to " one system of thought "—usually a system which contains a dozen or so stock concepts which are automatically applied again and again.

A word or two is necessary about the early development of the course.[1] Its need, as Miss Keir has observed, was already appreciated by Sully, who sketched out the main lines. Many years later, between 1925 and 1930, officials of both the Board of Education and of local education authorities more than once made informal approaches to those engaged in training students at the London Day Training College and the Department of Psychology, inquiring whether some more systematic course and some authoritative examination could be arranged for workers in the field of child guidance. It was alleged that " those who had been trained at child guidance clinics and elsewhere varied widely in their competence ; and the usual testimonial from the head of the clinic had not always proved a very safe guarantee of efficiency." As a result, the regulations for the Post-graduate Academic Diploma in Psychology were extended to include a special course and syllabus designed specifically for this sphere of work.

To enter for the course, candidates must first satisfy a sub-committee appointed by the Board of Studies in Psychology that they are suitably qualified. To begin with, we insist that all who enter for the specialized Diploma courses should have an honours degree in general psychology or an equivalent : the degree course takes three to four years ; and includes instruction in affective and conative, as well as cognitive psychology, in psychoanalytic principles, in the essentials of social, anthropological, and child psychology, and in practical work ; in the past, candidates have been required to take a subsidiary subject ; and my recommendation was usually sociology. Secondly, all entrants for the Diploma are also required to have had some experience of teaching and work with children. Thirdly, at a preliminary interview an effort is made to eliminate those whose personality is unsuitable.

The course itself "normally extends over two academic years" and involves both a written and a practical examination. The lectures include courses on personality, individual differences (covering deficiency, backwardness, special disabilities, delinquency, emotional and neurotic disorders), social psychology, abnormal psychology (by a psychologist with medical and psychiatric qualifications), the principles of learning, training, and teaching special subjects, and the principles of child guidance.[2] As part of their practical work all candidates must attend not less than 200 hours at a child guidance centre, approved for the purpose by the university. In addition, they visit representative types of schools and institutions, and carry out interviewing, mental testing, observation (in the playroom and elsewhere), report-writing, and remedial work—all under individual supervision. In my own department, they also attended demonstrations and examinations of typical examples of defective, backward, neurotic and delinquent children, and thus acquired some familiarity with the clinical types and with the minor diseases of childhood that are likely to affect behaviour or school work. Throughout the course special emphasis was laid on the influence of social conditions. The majority of the candidates have little first-hand knowledge of the kind of homes from which the dull, backward, and delinquent pupils of the elementary schools are drawn. Accordingly, they were encouraged to take part in evening work at settlements in the slums, and to spend a few days in a slum district, if possible, as guests or lodgers with a poor family. After the examination was passed, it was hoped that they would secure junior posts, in apprenticeship (as it were) to a senior psychologist.

[1] I myself have first-hand knowledge only of the facilities and plans for training psychologists in London. But, as an examiner at other universities, I can say with some assurance that the aims and methods are elsewhere much the same, though the practical facilities differ greatly from place to place and from time to time.

[2] The details of the syllabus were drawn up when I was Chairman of the Board of Studies in Psychology, and revised in consultation with Dr. Lucy Fildes, Dr. Hadfield, and others, and are obtainable in roneo'd form.

In practice it has not always been possible to carry out these arrangements to the full.[1] Nevertheless, even with these shortcomings, it will be seen that the training of the psychologist for the field of child guidance is far more thorough than anything which is obtained by the psychiatrist. On the other hand, a psychologist as such is not competent to make medical diagnoses, to carry out ' psychotherapy ' (in the sense of medical treatment), or to deal on his own responsibility with cases that are definitely pathological.

It follows that, as a result of the mode of selection and training, psychologists and psychiatrists are equipped to deal with very different types of case and very different types of problem. There is consequently much to be said for the dual scheme suggested by Professor Kennedy and others—a psychological centre and a psychiatric clinic.[2] But I should not agree with the way Professor Kennedy expresses the difference—" a *development* clinic under the supervision of a psychologist and a *behaviour* clinic under a psychiatrist " (p. 169, his italics). This distinction would seem to imply that he accepts Professor Masserman's definition of psychiatry and the view of the former General Secretary of the Child Guidance Council, namely, that psychiatry is the ' science of behaviour ' and that psychology is concerned solely with the cognitive or intellectual aspects of personality. After all, as long ago as 1912, McDougall defined psychology as the ' study of behaviour', and this slogan has been accepted by the behaviouristic school. On the other hand, there is little in the training of the psychiatrist to suggest that he is competent to deal with the *general* behaviour of children, as distinct from what Professor Kennedy has termed ' abnormal functioning '. No doubt ,as I have said in an earlier paper,[3] the ideal course of training would consist in the psychological training leading to the diploma or a higher degree in psychology, followed by a medical training such as that obtained by the psychiatrist. Few, however, have been able to afford either the time or the fees which both courses would require. Failing this, I should like it to be made possible for the psychologist to attend the more relevant parts of the medical course in addition to his systematic training in child psychology. Meanwhile, the facts I have summarized in the two preceding sections would seem to point to an obvious conclusion, namely, that psychologists are best suited to deal with the vast majority of cases referred to child guidance centres, and psychiatrists are best suited to deal with the more exceptional cases which are either plainly pathological or in which the possibility of pathological conditions, whether mental or physical, requires to be investigated.

IV.—THE SUCCESS OF THE PSYCHOLOGICAL AND THE PSYCHIATRIC APPROACH.

The Practical Results.—But I can scarcely hope that the arguments I have so far put forward will appear conclusive to the psychiatrist ; and the only convincing way to test their validity will be to examine the measure of success actually achieved by medical and psychological methods, respectively. The General Secretary of the Child Guidance Council, Dr. William Moodie, appears to agree with this criterion. In his opinion, " since child guidance became a branch of clinical medicine, it has rapidly become more and more exact in its

[1] For the ablest students, an alternative approach was provided in the courses for certain higher degrees. Such students can carry out researches in the field of child guidance for a doctorate (or less frequently a mastership), and as part of their training can take the more specialized parts of the Diploma course.

[2] See, for example, BLACKER, *loc. cit.*, pp. 73f.

[3] This *Journal*, XIX, 1949, pp. 39f. (Section VII, " The Respective Spheres of Psychology and Medicine.")

knowledge, sure in its methods, and successful in its results."[1] It is the successful results that really clinch the issue. Yet Dr. Moodie neither gives nor refers to any data that will support his verdict.

How often have eminent physicians made similar claims for medical treatment, which factual evidence has, in the end, altogether disproved! Dr. Rush, the leading physician of his day, introduced " a new and sure method of treating the yellow and other fevers "—repeated bleeding with huge doses of calomel; and succeeded in giving it a tremendous vogue:

> Howe'er their patients do complain
> Of heart or head, or nerve or vein,
> From temper rage, of fever tell,
> The Medicine still is Calomel.[2]

William Cobbett, in *The Rush Light*, took the unprecedented step of analysing the figures for mortality. This was the first occasion on which statistical data were used to verify such allegations; and Cobbett succeeded in demonstrating (as later statisticians showed for Horsley's treatment of mental deficiency) that the method actually killed more people than it cured.[3] Cobbett was convicted of slander, and forced to leave the country. But to-day, in nearly every branch of medicine, a physician or surgeon advocating a new mode of treatment, or a new type of operation, would follow Cobbett's procedure, and publish tabulated figures showing the results achieved by the procedure he was advocating side by side with the previous rate of recovery.[4] In psychiatry, however, as both Miss Keir and Dr. Banks have noted,[5] such data are harder to procure than in any other similar field of work. Neither of the medical contributors to this symposium offers any objective evidence of this kind. The psychologist who asks for such evidence is set down as a neurotic patient obviously suffering from 'frustration', and obsessed with a desire for the 'pseudo-security of statistics.' Like other laymen he should accept the physician's *ipse dixit* without question.[6]

[1] MOODIE, W.: *The Doctor and the Difficult Child*, 1940, p. viii.

[2] MITCHELL, T. D.: " Calomel," *New Orleans Med. Journ.*, I, 1844, pp. 30f. The poem appeared about thirty years earlier.

[3] Cf. GOODMAN, N.: *Benjamin Rush—Physician and Citizen*, 1934.

[4] " In clinical medicine to-day there is a demand for adequate proof of the efficacy of this or that form of treatment. However great our aversion to figures, the solution of most of the problems of clinical and preventive medicine depends on them " (Editor of the *Lancet*, Foreword to Bradford Hills' *Medical Statistics*, 1937, p. iii).

[5] Dr. R. L. Moody is by no means alone in rejecting what he calls " the pseudo-security of statistics." To take only the latest instance, Dr. O'Connor has recently written a letter (*Quart. Bull., Brit. Psych. Soc.*, III, 1952, pp. 115-6) strongly defending the exclusion of statistical tables from the *British Journal of Medical Psychology*. " The observations of the clinician in his consulting room," he contends, " are in every way as reliable as those of . . . statisticians." But how can he know they are reliable unless he applies some statistical check? And what would he think of a surgeon who made similar claims for new operative techniques and yet refused to offer statistical evidence?

[6] Quite recently the N.A.M.H. has attempted to persuade clinics within its organization to undertake what has so often been urged in the pages of this *Journal* (e.g., XVII, p. 17, cf. Valentine (9), p. 35)—a statistical inquiry into the success achieved by the treatment given. Their report (17) has appeared as these pages are passing through the press. Unfortunately, as Prof. MacCalman states in his 'Summing Up,' those concerned showed 'a certain hostility to the idea,' and (with exceptions) 'there has been a consistent failure to carry it out.' Even those who responded made no attempt to compare the results obtained with those of a control group, Hence, as is frankly admitted, there was a " fear that many of the 'recoveries' attributed to treatment should be attributed instead to spontaneous readjustment." As Dr. Maberly (former Medical Director of the Council) observes: " Some of the results are far from valid; some even quite useless; but the main purpose was to produce something to give the outsider " (p. 43.)

Most of those who have urged that the direction of child guidance centres should be placed in the hands of a medically qualified psychiatrist have done so on two main grounds: first, the diagnoses he makes are (so we are assured) far more trustworthy, and secondly the treatment he prescribes is far more effective. Assuming that such claims are amenable to the same type of evidence as they would require in the other branches of medicine, let us ask what factual evidence is available.

Diagnoses.—If I understand Professor Kennedy rightly, it is primarily on account of the psychiatrist's greater efficiency in diagnosis that he believes the psychiatrist should play the chief part in the child guidance team. "Once diagnosis is made, if the treatment is psychological" (as it usually is), "it cannot matter whether it is carried out by a medical man or not." Unlike the psychologist, who tries to "simplify the diagnostic situation" by attending only to those characteristics that can be tested and measured, "the physician (we are told) in his diagnosis habitually considers the large number of variables entering into the situation: he becomes adept at intelligent guesswork." One of Dr. Moody's main complaints against psychologists also turns upon what he calls their "superficial methods of diagnosis."

'Diagnosis' is a technical term of medicine, and means "the identification of a disease from the signs and symptoms discovered and its verbal statement by a precise designation": the decision that a particular youth is suffering from "general paralysis of the insane in its early stages" might serve as an obvious example.[1] Now the identification of a *disease* (and this word, I take it, is intended to cover any pathological condition) does not fall within the province of the psychologist. In the cases referred to the child guidance centre there will probably be about 10 to 15 per cent. in which the psychologist *suspects* a pathological condition; but it is not his function to make the 'diagnosis.'[2] His duty is to pass such cases on to a colleague who is medically qualified. As regards the non-pathological cases, his twofold task is (*a*) to arrive at some administrative classification—e.g., 'educationally subnormal,' 'mentally defective,' 'maladjusted,' 'adolescent instability,' 'suitable for treatment in the ordinary school,' etc., and (*b*) to discover, as completely as possible, the causes, both internal and external, which are combining to produce the behaviour complained of, and to find ways in which they may be removed or

[1] It is sometimes supposed that, in dealing with functional mental disorders as distinct from organic, Freud and his followers had repudiated the idea of 'diagnosis' in the traditional sense. But this does not seem to be the case. In his book on *The Treatment of the Neuroses*, Dr. Ernest Jones, the most eminent of British psychoanalysts, uses the regular headings for the successive sections of his chapters: in dealing with 'anxiety neurosis,' for example, after a formal definition, he gives us sections headed 'A. Symptoms,' 'B. Diagnosis,' 'C. Pathogenesis' (i.e., etiology), and 'D. Treatment' (cf. *op. cit.*, chap. III). In the field of psychological medicine, Dr. Martin tells us (p. 123), "diagnosis was the triumph of the Kraepelinian system" (based, as he points out, on the atomistic psychology of his teacher, Wundt). However, an increasing number of psychiatrists seem more and more inclined to follow the psychologist in recognizing that, when dealing with 'functional' conditions, particularly among children, any clear-cut scheme of 'types' or 'illnesses' is out of place. See, however, G. W. Allport's criticisms of "the medical system-builders of the nineteenth and twentieth century" (*Psych. Bull.*, XXXVII, 1940, pp. 1-23).

[2] Miss Davidson, it is true, in her discussion of the 'functions' of the psychologist (this *Journal*, XXII, p. 1), heads her first section "Diagnosis." But I think there is nothing in her statements that conflicts with what I have said. She appears to use the term in its regular sense, since she refers explicitly to 'illness'; and I imagine she would agree that it is not the 'function' of the psychologist to pronounce a final judgment on the name or nature of any 'illness.' What she is referring to are merely "the *contributions* which the psychologist can make to actual diagnosis."

rectified. From the days of Sully onwards, psychologists have insisted on the fact of multiple causation. For them ' mental deficiency ' is not a single clear-cut clinical entity : nor does ' delinquency ' constitute a specific form of ' mental illness.' In nearly all such conditions a number of causes are involved ; and the causal pattern varies from one individual to another. In short, with rare exceptions, the cases seen at child guidance centres are so mixed, and show so much overlapping, that the only scientific classification (if such classification were really required) would be a ' factorial classification,' not a ' diagnostic classification.' That, however, is a view which Professor Kennedy and Dr. Moody apparently would not accept ; and it is this reluctance on the part of the psychologist to pin technical labels on the cases passing through his hands that makes them complain that the psychologist's attempts at ' diagnosis ' are inadequate or superficial.

However, let us consider how far the ' intelligent guesswork ' of the psychiatrist (as Professor Kennedy describes it) yields results that can be trusted. Whether or not the verdicts of the psychiatrists differ in precision or profundity from those of the psychologists, the simplest test is the extent to which they agree with each other. In the course of inquiries carried out before the war, I attempted to compare the data contained in a large number of psychological and psychiatric reports on school pupils ; and I began by tabulating the frequency of the commoner diagnostic categories. Table I reproduces an abbreviated summary of figures obtained from psychiatric reports at three child guidance clinics : at one of them two sets of figures were calculated because, during the interval, it changed its director. Since in its proper sense the term diagnosis relates only to illness, figures for intellectual or educational disabilities, and for vague descriptive categories such as ' habit disorders,' ' behaviour disorders,' and ' delinquency,' have been omitted. The relative frequencies of the different diagnoses are shown as percentages.

TABLE I

DIAGNOSES OF CASES REFERRED TO CHILD GUIDANCE CLINICS

Diagnosis	Clinic			
	A1	A2	B	C
Hysteria	7	15	1	0
Neurasthenia	12	0	16	1
Obsessional Conditions	9	0	0	4
Other psychoneuroses (chiefly anxiety states)	33	28	24	52
Schizophrenia	0	7	0	2
Other psychotic conditions	0	3	0	8
Psychopathic	0	26	15	0
" Disorders of personality " (unspecified)	15	21	19	32
Glycopenic disorders	8	0	13	0
Chorea	12	0	9	1
Epilepsy	4	0	3	0
Total	100	100	100	100

There is a surprising divergence. It is scarcely possible to suppose that elementary school children differ from one district to another as widely as the table would suggest. Moreover the most striking differences are observed at the same clinic (A) : here the proportions changed quite abruptly with the change of

director. The way in which certain psychiatrists deliberately avoid such categories as ' psychopathic,' ' neurasthenic,' or ' choreic,' while others use them freely, shows how personal and subjective such diagnoses are. These and similar points of disagreement arise largely from the acute conflict between the different schools of child psychiatry—a conflict which is not likely to be resolved until ' child psychiatrists ' follow the example of ' child psychologists ' and apply objective methods for verifying their rival hypotheses. As it is, the schools of Jung and Adler contradict those of Freud ; and the various branches of Freudian psychiatry contradict each other : in the field of child analysis, for example, Mrs. Melanie Klein and the British Psychoanalytical Society entirely reject the views of Miss Anna Freud) ;[1] and finally many psychiatrists, if not most, distrust the psychoanalytic theories of any and every school.

The foregoing conclusions are borne out by a review of those cases in which the same child has been seen by two or more psychiatrists. Provided the second did not see or know the report of the first, the diagnoses reveal wide and frequent discrepancies. In a series of 127 reports which I have examined, it is the same (or at least equivalent) in only 43 per cent.—less than half.[2]

In my view, all these conflicts and discrepancies lend strong support to the time-honoured contention of the psychologist, that the majority of the cases seen at child guidance clinics cannot be fitted into neat nosological schemes, such as the followers of Kraepelin, Freud, Meyer, and others still favour. Most of the so-called ' diagnostic symptoms ' are normal reactions of the child's personality to abnormal features in the child's environment. It is, therefore, the total situation (including the child) that calls for an intensive psychological study in each individual case. Be that as it may, it no longer seems possible to maintain that child guidance, treated as a branch of medicine, has become " more sure in its methods and more exact in its knowledge."

Such divergences are characteristic of psychiatric diagnoses not only in this country, but also in America, and not only for children, but also for adults. In a volume recently published, based on the work of the Research Branch of the Information and Education Division in the War Department during World War II, the authors print a detailed analysis of the results of the psychiatric examinations carried out at all the induction stations in the United States for a certain period in 1945. The number examined amounted to nearly 100,000. It is stated that " the proportions of men rejected on psychiatric grounds varied all the way from 0.5 per cent. at one induction station to 50·6 per cent. at another " ; further, of those rejected by the psychiatrists, " the proportions classified as psychoneurotic varied from 2·7 per cent. to 90·2 per cent., while those classified as psychopathic varied from 0 per cent. up to 81·3 per cent." The writers point out that it is incredible that the incidence of different types of mental illness should really vary in this way from

[1] Cf. FREUD, ANNA : *The Psychoanalytic Treatment of Children*, 1946, pp. ixf. and refs. In (13), although Dr. Stalker has a long chapter expounding the concept of ' The Psychopathic Personality,' Dr. Moodie on another page assures us that " like the diagnosis of moral defect, it is gradually being given up."

[2] The most familiar instances of such contradiction are to be found in the evidence given by psychiatrists in court. I may add that my records for children include numerous cases in which errors in the diagnosis were subsequently falsified by the child's own after history. The commonest and clearest instances are those of alleged ' mental deficiency ' and ' congenital alexia ' (or some approximate equivalent, e.g., ' congenital auditory imperception ') : in the cases I have in mind the psychiatrist had commonly pronounced the case incurable, and the teacher, parent, psychologist, or the sheer lapse of time, had nevertheless effected a manifest cure. In other instances some important organic factor had been overlooked or denied. However, every physician and every psychologist commits mistakes ; and, until we can demonstrate by actual figures that those of the psychiatrist are less (or more) frequent by comparison with those of the psychologist, I think little would be gained by counting up the numbers as they stand.

one station to another ; and they are able to cite objective evidence, based on tests and other data, indicating that, in point of fact, the local differences must be comparatively small. They conclude that such variations " may seem almost fantastic ; but one must remember that psychiatry is still far from an exact science."[1]

Success of Treatment.—Dr. Moody apparently believes that psychologists are just as " superficial " in their " methods of treatment " as in their " methods of diagnosis." But again, he offers no evidence. The only final criterion for the adequacy of any form of treatment is the success achieved. During my own work for the London County Council, it was part of my task to secure after-histories in the form of periodic reports on children referred for treatment to a psychologist or a child guidance clinic under psychiatric direction. In Table II I have endeavoured to summarize the results as recorded in the latest reports available for the various cases thus followed up. The figures give percentages of the total number of cases in each category.[2]

TABLE II

SUBSEQUENT REPORTS ON CHILD GUIDANCE CASES

Category	Dealt with by Psychologist			Dealt with by Psychiatrist		
	Partly Improved	Satis-factory	Total	Partly Improved	Satis-factory	Total
Dull and Backward	40	11	51	34	8	42
Merely Backward	37	46	83	32	39	71
Special Disabilities	33	44	77	30	13	43
Delinquency	30	36	66	28	24	52
Emotional Disorders.....	42	21	63	39	15	54
Average	36	32	68	32	20	52

The differences between the totals are all significant. The largest difference appears in the case of special disabilities (chiefly disabilities in reading) ; the smallest difference in those that I have grouped together as cases of ' emotional disorder ' ; (these consist mainly of what are usually described in the clinic reports as ' psycho-neuroses '). Taking the averages, we note that of cases referred to the psychologist's department, 68 per cent. were improved, and of

[1] S. A. STOUFFER, *et al.*, *Measurement and Prediction*, 1950 (Vol. IV of *Studies in Social Psychology in World War II*), pp. 475f.

[2] I have included only those cases in which at least a year elapsed between the cessation of treatment and the report secured. The numbers vary from just over 100 cases of ' special disability ' to nearly 600 cases of ' emotional disorder.'

In the first three categories rather more were referred to the psychologist, and in the last of all rather more were referred to the psychiatrist. I may add that, if the cases had been restricted to those in which the recommendations were fully carried out, the figures, particularly for those referred to the psychologist, would be greatly enlarged. Thus in the cases of delinquency the total figure would rise to over 90 per cent. ; but more than half the cases would then have been excluded. There is no reason to suppose that those referred to a psychologist or to a psychiatrist differed in gravity : whether a child was referred to one or the other depended mainly on convenience or locality.

those referred to child guidance clinics under psychiatric direction, only 52 per cent. ; for untreated cases the corresponding figure was 47 per cent.[1]

It is, however, scarcely reasonable to ask the psychiatrist to accept the results of a statistical analysis carried out by a psychologist, unless they are corroborated from a more impartial source. Let us, therefore, turn to an inquiry undertaken by a local education authority which desired simply to ascertain, in the interests of efficiency and economy, what degree of success was obtained by the two different types of directorship. At Sheffield, we are told, the child guidance clinic was originally placed under psychiatric direction ; but later the responsibility was transferred to a psychologist. A careful analysis showed that, " while the clinic was under psychiatric direction, 20 per cent. of the cases never attended at all, and of those seen only 65 per cent. were reported as progressing satisfactorily. When an educational psychologist was in charge, the proportions changed to 3 per cent. and 80 per cent., respectively." For these reasons the Committee " take the definite view that the organization of the child guidance service should rest with the educational psychologist." A " small proportion " of the cases, they believe, would benefit by psychiatric treatment ; and for these a medically qualified psychiatrist is desirable. But it is not considered advisable that he should act as director. Moreover, " since in general the services of a psychiatrist require higher payment than those of an educational psychologist, it seems unwise and uneconomic to cause a psychiatrist to be responsible."[2]

On the relative merits of psychological and psychiatric treatment, Miss Keir refers to other evidence, from America as well as from this country. There, in following up cases from clinics differing widely in type of treatment, it has been stated that " the proportion of cures is about the same despite differences of treatment," and that " the recovery rates of treated groups and those who have been left untreated are regrettably similar."[3]

Of the various American investigations that she mentions, one of the earliest and most instructive is that carried out nearly fifteen years ago by Landis.[4] His main results, together with data from other publications, have recently been reproduced in convenient form by Dr. Eysenck.[5] The final conclusions are summarized as follows : " Patients treated by means of psychoanalysis improve to the extent of 44 per cent. ; patients treated eclectically improve to the extent of 64 per cent. ; patients treated only custodially or by G.P.'s improve to the extent of 72 per cent. There thus appears to be an inverse correlation between recovery and psychotherapy ; the more psychotherapy, the smaller the recovery rate. We are left in the position where any belief in psychotherapy depends on faith, not on scientifically demonstrated fact." Dr. Eysenck expresses his *prima facie* inferences in a somewhat challenging form. But, even when full allowance has been made for the shortcomings of the data, it must be admitted that the high claims so frequently

[1] In the recent N.A.M.H. inquiry 50 per cent. were " regarded at the end of the treatment " as improved, and 16 per cent. as " symptom-free " (17, p. 7). But whether a psychiatrist regards a case as improved at the end of this treatment is not a very convincing criterion. What is needed is independent evidence from those referring the case, checked after at least a year's interval, and compared with similar evidence for an analogous group of untreated cases (cf. p. 110).

[2] *The Child Guidance Clinic in Practice* : *A Report on the Sheffield Clinic for the Period, July*, 1940, *to June*, 1943.

[3] Cf. ASH, P. : " The Reliability of Psychiatric Diagnoses," *J. Abnorm. Soc. Psych.*, XLIV, 1949, pp. 272f. ; also *Proceedings of the Child Guidance Interclinic Conference*, 1937, pp. 55, 60.

[4] LANDIS, C. : " A Statistical Evaluation of Psychotherapeutic Methods," *ap.* HINSIE, L. E., *Concepts and Problems of Psycho-Therapy*, 1937, chap. V.

[5] *Science and Personality*, 1952, pp. 30f.

made for modern psychotherapeutic treatment are scarcely justified by any available evidence. Dr. Moody will, no doubt, object that here the psychologist, in his usual over-confidence, is fortifying himself with the " pseudo-security of statistics." But is not the pseudo-security of those who ignore the statistical evidence still more precarious, and fraught with risks not only to their theories, but also their patients ?

Once again it may be helpful to consider the apparent reasons for the differences. (i) A scrutiny of numerous psychiatric reports suggests that, as a rule, the *psychological* study of the child's individual characteristics is extremely limited.[1] There may be a full account of what are sometimes called " dynamic mechanisms " (many psychiatrists finding the same type of 'mechanism' in something like half their cases) ; but there is very little about the child's temperamental peculiarities, his special disabilities, the actual factors responsible for his lack of adjustment, or the tendencies which might be exploited to secure better adjustment. (ii) On comparing the recommendations made, I find that psychiatrists refer far less frequently than psychologists to definite changes which might be made in the child s *environment*, whether at home or at school. The psychiatrist hardly ever visits the home or the school himself. The reports on the home are furnished by the ' psychiatric social worker,' and are usually more concerned with ' psychiatric ' conditions than with 'social.'[2] As a result, the suggestions made to parents and others commonly consist of broad generalities, not of explicit indications as to how this and that emergency is to be met. (iii) Psychiatrists make very little use of methods of *child training*. This is true, not only in cases of intellectual disability, but still more in cases of emotional or moral disturbances. The majority still think of treatment as consisting rather in what they term ' therapy ' than in efforts at education or re-education—the control or sublimation of emotional tendencies, the breaking of undesirable habits, the formation of desirable habits, in short, character training in every shape and form.[3] (iv) As teachers so often complain, the reports, though " interesting as psychiatric studies, when intelligible," nevertheless, " often show a *failure to appreciate the particular problems and opportunities of the teacher.*" They offer few concrete or practical suggestions which teachers can follow up. " It is very rare for the psychiatrist to recommend particular methods which will assist the child with his educational difficulties in the classroom or the teacher with his disciplinary troubles."[4]

[1] In discussing ' Trends in the Examination of Cases ' Dr. Moodie tells us that " the psychiatric interview is used more to form a general impression than to attempt any deep examination," and that it is " now the usual practice " to construct a picture of the child's life from the case-history (" the duty of the psychiatric social worker ") and to depend on this " for diagnostic data rather than on direct examination of the child " (pp. 183-4).

[2] I may add that, in many centres, even the social worker does not visit the home, but bases her report merely on an interview with the parent at the clinic.

[3] According to Dr. Moodie, " direct treatment is tedious and time-consuming," and the " modern tendency " is to " reduce it to a minimum." The ' modern trend ' is to allow the child to express his feelings freely in words, play, etc. : some hold that " these should be interpreted to him " ; but " the balance of opinion " is in favour of those who hold that the mere expression is sufficient, and " no more need be done."

The importance of character-training in child guidance cases has been repeatedly urged by British psychologists (cf. 3 and 4). Quite recently a similar point of view has been put forward by American psychologists (e.g., Shoben, E. L., " A Learning—Theory of Psychotherapy," *Harv. Educ. Rev.*, XVIII, pp. 129f.) ; but they commonly regard it as essentially a matter of ' re-conditioning,' whereas British writers have always treated it as ' a process of progressive organization or integration.' " A neurotic disorder," says McDougall," is a failure of integration " (*Abnormal Psychology*, 1926, pp. 54, 396, 524 : cf. (7), pp. 206f.). Mowrer puts forward a very similar view (ap. 15, pp. 312f.).

[4] I am quoting a criticism made by a head mistress at a recent conference, and endorsed by most of the teachers present.

In short, the psychiatrist is too apt to envisage all his cases as medical or psychoanalytic problems rather than as psychological, educational, or social problems.

V.—SUMMARY AND CONCLUSIONS.

1.—Of the cases commonly referred to child guidance centres, only about 10 to 15 per cent. appear to be pathological cases or cases in which the possibility of some pathological condition requires investigation. All the evidence available confirms Sully's dictum that " during childhood the vast majority of cases consist of deviations *within* the normal rather than aberrations *from* the normal."[1] With few exceptions, the essential problem is to investigate a more or less complex form of maladjustment between the child's personality and the environmental conditions, and not simply to diagnose or treat some definite pathological disorder from which the child is suffering.

2.—A comparative study of case-reports and after-histories shows (*a*) that the diagnoses of the psychiatrist are, as a rule, highly subjective, and vary widely from one psychiatrist to another, according to the particular school to which he adheres, and (*b*) that, judged by the results achieved, the psychiatrist (except in cases that are definitely pathological) is less successful than the psychologist.

3.—The training of the psychiatrist enables him to deal more effectively with pathological conditions when they exist or are suspected. But, in his work with the majority of children, owing to his inadequate psychological training, he is too prone to interpret normal reactions in psychopathological terms, and to overlook the specific psychological, educational, and social aspects of each individual case. On the other hand, the training of the professional psychologist includes a thorough study of the whole range of individual differences, cognitive, affective, and conative, a first-hand acquaintance with home and school conditions, and a detailed knowledge of the various ways in which specific environmental conditions may help or hinder normal development. He is consequently far better equipped to deal with the wide variety of problems occurring in normal (i.e., non-pathological) cases.

4.—There is a need both for psychological and for psychiatric experts in the child guidance service. Each should concern himself primarily with the special type of work for which he has been trained, but should, at the same time, possess a sympathetic appreciation of the contributions of his colleague. Since the majority of cases call rather for a psychologist who can understand and train the child than for a physician who can diagnose and treat mental illnesses, " the key person in the child guidance service is the pscyhologist."

5.—The results achieved, often at the cost of considerable public expense, fall far short of what seems possible and desirable. Hence, there is an urgent need for more scientific research, particularly on the efficacy of different modes of treatment.

REFERENCES

1. SULLY, J. (1892): " The Service of Psychology to Education," *Amer. Educ. Rev.*, IV, pp. 313-324.
2. SULLY, J. (1896): *Studies of Childhood* (Longmans, Green, and Co.).
3. BURT, C. (1916): " The Training of Emotions in Children," *School Hygiene*, VII, pp. 1-14.
4. BURT, C. (1917): " The Unstable Child " *Child Study*, X, pp 61-78.
5. BURT, C. (1917): *The Distribution and Relations of Educational Abilities* (P. S. King).

[1] Quoted by Miss Keir, *loc. cit.*, p. 11.

6. HENDERSON, D. K., and GILLESPIE, R. D. (1933) : *A Textbook of Psychiatry* (Oxford University Press).
7. BURT, C. (1935) : *The Subnormal Mind* (Oxford University Press).
8. GORDON, R. G., ed. (1939) : *A Survey of Child Psychiatry* (Oxford University Press).
9. VALENTINE, C. W. (1940) : *The Difficult Child and the Problem of Discipline* (Methuen).
10. BLACKER, C. P. (1946) : *Neurosis and the Mental Health Services* (Oxford University Press).
11. BARTON-HALL, M. (1947) : *The Psychiatric Examination of the School Child* (Arnold).
12. VALENTINE, C. W. (1948) : "Present-day Trends and Dangers in the Field of Psychology" (Pres. Add. Brit. Psych. Soc.), *Brit. J. Educ. Psych.*, XVIII, pp. 134-147.
13. HARRIS, N. G. (1948) : *Modern Trends in Psychological Medicine* (Butterworth).
14. BURT, C. and HOWARD, M. (1952) : "The Nature and Causes of Maladjustment among Children of School Age," *Brit. J. Psych Stat. Sect.*, V, pp. 39-58.
15. BROWER, D. and ABT, L. E., ed. (1952). *Progress in Clinical Psychology*. (Greene and Stratton.)
16. O'GORMAN, *et al.* (1952) : "Psychoses in Childhood," (*Proc. Roy. Soc. Med.*, XLV, pp. 797-802.
17. NATIONAL ASSOCIATION FOR MENTAL HEALTH (1952). *Ninth Child Guidance Interclinic Conference* (N.A.M.H. Publications Department).

YOUNG WORKERS AT A COUNTY COLLEGE

A Pioneer Investigation of the Needs, Interests, and Attitudes of 380 Young Workers Attending A County College.*

By E. M. EPPEL and M. EPPEL
(*Department of Extra-Mural Studies, University of London*).

PART I.

I.—*Introduction.* II.—*Scope and methods.* III.—*The students investigated.* IV.—*Jobs.* V.—*Educational interests.*

I.—Introduction.

Although the provisions of the 1944 and 1946 (Scotland) Education Acts relating to the further education of young workers between 15 and 18 years of age are not yet obligatory, those responsible for such schemes as have been undertaken are faced with a multitude of problems. In this field of education the lack of standards, reliable methods, and even elementary information about students may be a serious handicap.

There is a great need for systematic data about the attitudes and interests of the adolescents concerned in further education. It is important to test the assumptions and check the generalisations which are inevitably made in this rapidly developing sphere; as L. J. Barnes said at Oxford in 1948, "We want more detailed and systematic knowledge . . . about the beliefs and desires of young workers with regard to their own educational needs."[1] Olive Wheeler[2] indicated the importance of such data in formulating policy—"A knowledge of the interests of a representative cross-section of young workers . . . would be useful in planning the work of a county college."

This short-term research was initiated to assist in filling some of the gaps in our knowledge, and to indicate some lines of investigation for the future.

II.—Scope and methods.

Type of College.—The College investigated was part of the post-war provisions for further education of young workers by a large Scottish local authority. A limited number of industrial firms and Government departments voluntarily released employees of both sexes between the ages of 15 and 18 one day each week. The employers were represented on a consultative advisory panel which met regularly to discuss policy and progress. The education provided for the students in this enquiry was non-vocational.

Sources of Information.—(1) 380 one-day release students in the third term of their first year at the County College concerned, i.e., the complete group apart from absentees (230 boys, 150 girls) were each taken for three periods of 50 minutes, i.e., thirty-one classes of students—seventeen classes of boys,

* Grateful acknowledgements are due to Mr. T. M. Banks, Organiser of Further Education for Glasgow Corporation, who encouraged the initiation of this research and provided facilities for carrying it out.

[1] *The Education of the Young Worker* (Oxford Univ. Press for King George's Jubilee Trust, 1948-49-50).

[2] Wheeler, O.: "A Psychological Approach to the Work of County Colleges", *Occup. Psych.*, Vol. XXIII, No. 4.

fourteen classes of girls, one mixed class. In the first period they were told about the aims of the inquiry, then given a general talk on Social Investigations, their methods and importance in the modern world. The aim of this period was to build up an informal and friendly relationship with the students so that they would accept the investigator as a teacher, interested in their ideas and opinions.

In the second and third periods each student completed :

(*a*) N.I.I.P. non-verbal group intelligence test 70/23.

(*b*) Under the investigator's supervision, a questionnaire divided into sections on the Job, Home, Education, and Leisure Interests.

The original questionnaire was drawn up with the help of young workers themselves, viz., two groups of 15-16 year-old Department Store assistants, whom one of the investigators had taken for four weekly talks on Family Life. Their reactions, answers, and suggestions were used as a basis for planning and modifying the subsequent questionnaire.

(*c*) Short essays on the following topics :

(i) Why I chose my job.
(ii) The things I missed when I left school.
(iii) Why I come to the College.
(iv) What I would do with a present of £50.

These short essays helped to make up for the recognised shortcomings of questionnaires. A good deal of the unsolicited information in the essays was probably as valuable as, and sometimes considerably more revealing than, the direct questions. Questionnaires and essays were done anonymously by the students in order to reassure the cautious who might have feared repercussions.

(2) Throughout the investigations every effort was made to have frank discussions of the problems with staff and students during meal-times and leisure breaks. The material garnered from these informal discussions proved most valuable in suggesting lines of enquiry, and in providing a background to the results of the more formal methods used.

(3) Further background material was provided by visits to some of the firms at which the young workers were employed, by discussions with employers, supervisors, and personnel officers, and by reading the minutes of the Advisory panel's meetings.

III.—The students investigated.

TABLE I

Age of the Students

Age	15	16	17	18[1]	Total
Boys	62	108	52	8	230
Girls	14	44	60	32	150
Total	76	152	112	40	380

It will be seen that the age range covers all students attending for further education, although they were all in their first year at the College.

Intelligence of the Students.—The grading was based on the N.I.I.P. group test 70/23, giving five categories of intelligence for the general population, viz., A=top 10 per cent., B=next 20 per cent., C=middle 40 per cent., D= next 20 per cent., E=bottom 10 per cent.

[1] In some parts of this investigation the very small number of 18 year old boys is combined with the 17 year group.

TABLE II

INTELLIGENCE OF STUDENTS

Category of Intelligence	A	B	C	D	E
% of Boys (230)	13	21	31	20	15
% of Girls (150)	8	29	39	16	8[1]

All categories of intelligence are represented, and this even for individual classes of students attending on a given day. By way of illustration, in one girls' class the students with the highest and lowest scores in the intelligence test were sitting side by side.

The great scatter indicates the importance of some kind of grading for effective education. It is felt that easily administered group tests such as the one used would help at any rate to reveal gross differences in intelligence, and make the work of students and staff easier and more fruitful.

Educational Achievement.—It was quickly obvious that there were considerable differences between individuals in achievement in the basic school subjects. Although no attempt was made to investigate this problem specifically, some light was thrown on standards of literacy by the completed questionnaire and essays.

A few examples may suffice to show that the problem exists. Some could not spell the names of the newspapers and books they claimed to read, or of the jobs on which they or their parents were engaged.[2] e.g., Daily Mirrow, Chronical, Revalei, Inglish, Postmand, Tual makrs. Mercent naivy, Trade unin. offiial, Macnic, Gardinging, Asistan in tobacanist, Cabnimaker, I finnk, Good futcher, Colloge, Detter egicasitan (reason for coming to the College). ' I wood tour the schich hiland and then setle down in portree sky ' (16 year old boy's amibition).

There appears to be a real need for more accurate assessment of each student's level of attainment by means of standardized tests of spelling, reading, etc., applied at an early stage. When these indicate cases of serious retardation it is unsatisfactory to leave the regular College teacher to struggle with a condition whose cause may be emotional maladjustment, faulty education, or borderline mental deficiency. The exact responsibility of county colleges towards these students has not yet been defined, but there does seem to be a good case for the appointment of educational psychologists to the colleges, or the extension of the School Psychological service to meet the contingencies.

Occupational Background of the Students.—The students investigated were employed in the following occupations :

TABLE III

Boys		Girls	
Junior Postmen	142	Telephonists	50
Clerical Workers	3	Clerical workers	74
Sales Assistants	2	Sales Girls	19
Apprentices	83	Factory Girls	7
(e.g., fitters, turners, coppersmiths, boilermakers, electricians, joiners, moulders, draughtsmen).	230		150

[1] The higher average intelligence of the girls is probably explained by the fact that a large number of them were telephonists and Civil Service clerical workers. Cf. Table III.

[2] Cf. REED, B. H.: *Eighty-Thousand Adolescents* (Allen and Unwin, 1950), where similar observations were made.

Some information was obtained on whether these young workers were following the same careers as their parents and brothers or sisters, or whether changes in the social prestige of different jobs had appeared. Motives for choosing jobs are discussed later, but a general picture of parental and sibling occupations revealed no very striking social mobility among these young workers. Thus, the professions were almost entirely unrepresented among their parents, brothers, and sisters, apart from a couple of nurses, a policeman, and one school teacher. Very few of the parents were clerical workers, or business people. A small proportion of the students' mothers went out to work, less than 10 per cent. of the girls', and about 17 per cent. of the boys'.

IV.—Jobs.

Since the adolescent's first major adjustment on leaving school must necessarily be to his job, it is essential to consider the influence of his work in forming his expectations and attitudes towards adult responsibility. Whilst it is true that attitudes towards employment may be engendered by different types of secondary education, it is just as significant that attitudes towards further education may be engendered by his first experiences of employment. The young worker's reasons for choosing his job, his first impressions and second thoughts on his choice, his ambitions connected with his future, and the satisfactions and frustrations in his first experiences at work, play a vital part in his developing personality which no one concerned for his further education can afford to ignore.

The following subjects were, therefore, investigated: (1) Motives for choosing jobs; (2) satisfaction or discontent with jobs; (3) job ambitions.

(1) *Motives for choosing jobs.*—It is difficult sometimes to disentangle genuine motives for choosing jobs from reasons given "after the event." However, it is clear that nearly always the reasons for choice of first, and later jobs in some cases, were mixed; an average of at least two reasons was given by by both boys and girls. The reasons given fall into five main categories: (1) Economic; (2) conditions of work; (3) satisfactions from work; (4) family influence; (5) negative reasons.

There are statistically significant differences between boys and girls in some of the motives for job choice.

TABLE IV

Motives for Job Choice

	Economic	Conditions of work	Satisfactions from Work	Family Influence	Negative Reasons	Total
Boys (230)	272	69	53	36	34	464
Girls (150)	119	59	114	15	28	335

It is readily seen that the economic motive is most often given by the boys as the reason for choice.[1] (Chi-square value, $P < 0{\cdot}01$.)

The answers given by the girls reveal the difference that personal satisfactions derived from work (creative satisfactions, social satisfactions, etc.) are

[1] Compare, however, Ferguson, T., and Cunison, T.: *The Young Wage Earner* (Nuffield Foundation, 1952), who state that of the 837 boys in 'permanent' work of their 'own choice' the most important reason for choice was "interest in the work," followed by "security" and their "wages."

equally important with economic factors in determining choice. These two motives are significantly more powerful than any of the others. ($P<0{\cdot}01$.) This finding bears out the conclusions of investigations in industrial psychology into incentives for women,[1] which have stressed the importance of friendly atmosphere, sense of achievement, good relations with colleagues, understanding overseers, in the maintenance of morale and output. Further evidence for the sex difference noted here is provided by a direct comparison of the importance of the economic motive between boys and girls. It is shown to be significantly stronger in boys. ($P<0{\cdot}01$.) The importance of social and personal satisfactions as conscious motives among the girls is again demonstrated later in this investigation in the section on "Education."

General comments on job choices show a search for security, i.e., against illness, a slump, old age, strikes (which may be a carry-over directly from parental attitudes): a wish to improve their standards of living; a wish to enjoy companionship; a wish to be 'done with' education. (Cf. Negative Reasons.)

Some of the reasons given reveal a combination of a mature adult sense of responsibility and a childish desire to play.[2] The following quotations from their essays illustrate the various motives given:

'*I chose my job because . . .*

(*a*) *Economic Motives.*—"I will never be out of a job when there is a slump" (boy—16 years). "It is such a reliable job and you are sure to get a wage if your are ill, or on strike, etc." (boy—16 years). "The reasons are the good prospects, safe from a depression" (boy—15 years). "I always have my work if there was a slump or a great deal of unemployment" (boy—16 years). "There was a secure future in case of any post-war slump" (boy—16 years). "Good prospects and good wages which my mother needs" (boy—15 years). "Making a better life for myself, and able to support my mother and father in later years" (boy—17 years). "When you retire you have your pensions . . . which makes life more pleasant when you are old" (boy—15 years).

(*b*) *Conditions of Work.*—It's a clean job, and there is no dirty work about it" (boy—15 years). "A nice clean atmosphere, working with respectable people" (girl—17 years). "Because I enjoy the open air and like walking" (boy—15 years).

(*c*) *Satisfactions from Work.*—"There was a lot of boys of my own age so it would be fun" (boy—15 years). "For companionship. When I was a young child I lived with my grandmother who was rather strict and was denied the friendship of other children" (girl—17 years). "I would like to get on in the world . . . and I like the idea of getting supplied with a bike" (boy—16 years).

(*d*) *Parental Influence.*—"My father *made* me joint it" (boy—15 years). "To follow my father and grandfather" (boy—16 years). "Because there is to many fathers want there boys to go into jobs they (fathers) chose" (boy—17 years). "My mum said factory work would not suit me as she thinks me not fit. Really I do not know where she gets this idea of my weakness" (girl—18 years).

(*e*) *Negative Reasons.*—"I was in a hurry to start work and I did not watch what I was doing" (boy—16 years). "I was only 15 and I didn't no what kind of job I wanted" (boy—16 years). "I could not make up my mind so I joined the P.O. to have a look round" (boy—15 years). "I didn't want to go to

[1] Cf. MAIER, N. R. F.: *Psychology in Industry*, pp. 267 *seq.*

[2] Cf. TENEN, C.: "The Adolescent in the Factory" (*Brit. J. of Educ. Psych.*, Vol. XIV, Pt. I.)

night school, and this was the very job that night school was not needed" (boy—16 years). "There wasn't much of a selection" (boy—16 years). "Miss, I didna choose my job" (boy—17 years). "My imagination carried me away and surrounded the operator in mystery" (girl—17 years). "It was the toss of a coin" (girl—17 years).

(2) *Satisfaction with Job.*—The following tables indicate that more than half of the students, even at 15 years of age, had more than one job since leaving school.[1] However, as the Birmingham report indicated, too,[2] there is some degree of "job stability," only 10 boys and 6 girls having had more than three jobs since leaving school.

TABLE V

TOTAL NUMBER OF JOBS SINCE LEAVING SCHOOL.

No. of Jobs	15 years		16 years		17+ years		Totals	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
1	25	14	49	30	25	32	99	76
2	30	—	43	13	22	49	95	62
3	6	—	10	—	10	6	26	6
4	1	—	5	1	1	5	7	6
5+	—	—	1	—	2	—	3	—
Totals	62	14	108	44	60	92	230	150

There are *no* statistically significant differences between the total number of girls and the total number of boys who have changed their jobs at least once (P=0·2 to 0·1). Of the 205 boys and girls who have had more than one job, 152 worked in offices or as messengers, 27 as shop assistants, and only 10 as apprentices. A few were labourers or factory hands.

It was thought important to measure the degree of contentment with their jobs in order to understand young workers on their day off work at a county college. The following table indicates their feelings in this matter.

TABLE VI

ATTITUDE TO JOB.

Age in Years	LIKE		DISLIKE		INDIFFERENT		Totals	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
15	48	14	9	—	5	—	62	14
16	74	41	17	3	17	—	108	44
17+	33	72	21	15	6	5	60	92
Total	155	127	47	18	28	5	230	150

For *all* age groups, and for both sexes, a significantly higher number *like* than dislike their jobs. (Chi-square, P <0·01.)[3]

[1] Compare FERGUSON, T., and CUNISON, T., *op. cit.*, where it was found that 89·6 per cent. of the sample of 1,300 young Glasgow workers had changed their jobs at least once in the three years.

[2] Cf. REED, B. H., *op. cit.*

[3] FERGUSON, T., and CUNISON, T., *op. cit.*, found that 67·1 per cent. of the sample showed keen interest in their jobs. Only 1·5 per cent. showed they disliked their jobs however, which is a considerably smaller proportion than that indicated by the figures given above.

Among 17 year old boys, a considerably larger proportion dislike their jobs than in other age groups, which seems to indicate that some real change of attitude may be occurring with these older youths.[1]

Some insight into the causes of disappointment or disillusion in their jobs, as well as those of satisfaction, are revealed in their essays, and in the reports of the things they missed on leaving school. These are discussed later.

Satisfied Young Workers.—" The best thing is that I have a great future, the pay is very good and no one knows how much I may finish up with " (boy—15). " My job . . . interesting, and it is combined with brain and handwork " (boy—16 years). " Most of all the managers or bosses were all very good and understood the ways of boys at our age " (boy—15 years).

Discontented Young Workers.—" I thought it was a really exciting job. I have had a great disappointment . . . because once you are in it, it becomes just a matter of routine " (boy—15 years). " The one thing I don't like is the welfare officers promising things and don't keep their promise " (boy—16 years). " I thought I would like it and I did up to three months but then it started to get boring " (boy—17 years). " I wanted to be lots of things . . . the one I have not mentioned is the one I am serving. I do not like my job, but it is too late to change it " (boy—17 years). " Why should there be so many supervisors? Personally, I don't think they are necessary . . . why then should these women supervisors (majority of them old maids) stand guard over you and are just ready to pounce on you . . I think they are hard-hearted cruel women and get on people's nerves " (girl 18—years).

These attitudes must inevitably influence the degree of friendly co-operation, interest and enthusiasm which they manifest towards further education and the adults connected with it. Studies in occupational psychology have indicated the extent to which grievances may be displaced from the objects, persons, or institutions which have occasioned them, on to others, more accessible and not necessarily connected.

(3) *Ambitions.*—They were asked what they wished were their jobs and what they expected to earn at the age of 30 years. The following table indicates their wishes :

TABLE VII

JOB AMBITIONS.

Age in Years	Same Job		Different Job		Don't Know		Totals	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
15	34	12	28	2	—	—	62	14
16	59	29	43	15	6	—	108	44
17	28	37	30	23	2	—	60	60
18	—	8	—	24	—	—	—	32
Total	121	86	101	64	8	—	230	150

NOTE.—The very small number of 18 year old boys is included with the 17's.

Apart from the 15 year old girls, a substantial proportion at each age level would like to change their jobs. This is particularly noteworthy when it is

[1] In fact at this age, *liking* is greater than *disliking* only at a level of significance of between 5 per cent. and 2 per cent.

recalled that such a large proportion say they like their jobs. There are no significant differences between boys' and girls' totals. (P=0·8 to 0·9.)[1]

Of the 18 year old girls three times as many would like to change their jobs as are content with them. This is a relatively small sample, but the figures give significant proof that most of these girls think they would be happier in some other occupation.[2]

Despite considerable feelings of material frustration very few of these young workers live in a world of fantasy in connection with possible alternative occupations. This is exemplified by the choices made. Among the boys there is a slight tendency in the direction of jobs involving travel or at any rate greater freedom of movement (e.g., 24 would like to join the Navy in various capacities), but almost every job chosen is *just possible* of achievement. Among the girls there is a tendency towards jobs involving increased social contacts and personal relationships (e.g., nurses, receptionists) and also towards a travel occupation which has been very highly publicised—Air Hostess. Only two girls said they would like to be Film Stars or Actresses.

When job expectations at *age* 30 are considered, the realistic and conventional attitude of these working girls is most strikingly shown. 114 out of 150 said they would like to be *housewives* and *mothers* at 30 years of age.[3] The following quotations illustrate this significant fact :

Girls' Ambitions at 30.—" To be a wife and mother with a nice little home " (girl—15 years). " To be a wife with three children " (girl—16 years). " I hope not to be working, I hope to be married " (girl—17 years). " Happily married with four of a family, two boys and two girls " (girl—17 years). " I should like to be married to a missionary and have children " (girl—17 years). " Married with a home of my own " (girl—18 years). " Happily married with maybe two of a family " (girl—18 years).

Despite the very great increase in the number of married women in industry in the years in which these girls were growing up, *not one* gave any indication of an awareness of the possibility that she might have to combine a job with running a home at the age of 30.

Wage Expectations at 30.—Few of the girls suggested a wage, most of them merely writing that they expected to be housewives and not earning. 193 boys suggested an expected wage, as Table VIII indicates.

No significant differences exist between the mean wage expectations of the 15 and 16 year groups, or between 16 and 17 year groups. A highly significant difference does, however, exist between means for 15 and 17 year groups.* The great majority of the boys expected a wage at 30 years which, in present economic conditions, is a *possibility*. This reinforces the previous finding about the reality attitude predominating over fantasy.

* Significance of difference between means was calculated by the formula :

$$\text{Critical Ratio (C.R.)} = \frac{\textit{Difference}}{\sigma \text{ Diff.}} \text{ where}$$

Difference is the actual difference between means, and σ Diff. is the square root of the sum of the squared standard errors of the two distributions. C.R. of 3 or more is significant. This C.R.=4·6.

[1] The B.B.C. publication, *A Youth Inquiry*, p. 28 (1951) shows strikingly similar figures, viz., 40 per cent. of both samples used wanted a change of work.

[2] TENEN, C., *op. cit.*, where the number of complaints indicating dissatisfaction with jobs was found to increase with age.

[3] Cf. The statement by O. WHEELER, *op. cit*, that a very large proportion of the girls at Rugby Day Continuation College were primarily interested in *home making*.

TABLE VIII

WAGE (WEEKLY) EXPECTATIONS AT AGE 30.

BOYS ONLY.

£	15 years	16 years	17+ years
3	—	—	—
4	—	1	—
5	7	2	—
6	13	27	4
7	7	13	9
8	7	14	10
9	6	11	8
10	5	14	12
12	—	3	3
15	—	5	7
20	1	1	2
25	—	—	1
Totals	46	91	56
Averages ...	7·44	8·19	10·27
Standard Deviations	2·456	2·646	3·789

V.—EDUCATIONAL INTERESTS.

The aim here was to ascertain the students' feelings on the value of Further Education, as well as to look for a constructive guide to those subjects and activities which they most enjoyed. In addition, it was hoped to discover whether they still carried over attitudes to education which they had acquired in school, and whether they were aware of any things they had missed since leaving school.

The short essay set, on "*Why I come to the College,*" proved informative in this connection. The reasons given were analysed into two categories—*positive* and *negative*. *Positive Reasons* far outweighed negative,[1] a number of students giving more than one each.

TABLE IX

REASONS FOR ATTENDING.

	Boys (230)	Girls (150)	Total
Positive.....	261	201	462
Negative	40	13	53

This is an encouraging sign that the vast majority of the students had *some* idea of the nature and purpose of the College's existence, even though many of them said vaguely "... for further education," or "... to improve my further education."

[1] Compare the finding by WALL, W. D. ("The Decay of Educational Attainments," *Brit. J. of Educ. Psych.*, Vol. XIV, Pt. I.) that most of the boys *enjoyed* coming for urther training.

Negative Reasons were advanced by only about one student in seven, but even so, it seems important to realise that this minority which either had " no idea " why it came, or stated that it was " to have a day off work " or that it had " no option," may play a disproportionate part in undermining morale. It was indicative of their negative attitudes that they sometimes imputed the worst motives to the people providing further education. Some suggested that they had been sent " to give our supervisors a rest," " to swindle us out of our bonus," or " because they took on too many apprentices and don't know what to do with them all." Even where those with negative ideas of why they attended a county college had *not* a grudging and unco-operative attitude, they lacked, nevertheless, that awareness of the nature of democratic citizenship which it is aimed to foster. Those students who believed they attended merely " to break the monotony from the dull routine of work," need as much stimulating to a sense of the value of further education as do the resentful ones. Enlightenment on the aims of Further Education and the fostering of positive attitudes in this 1 in 7 minority would seem to be an important goal.

Some Examples of Negative Reasons Given.—" I have no idea. And if I had any say I wouldn't come at all " (girl—17 years). " I was told to do so by the work. Why I really do not know but I think it is something to do with Further Education. I don't think it is much of a success, because we don't get the things we really want " (boy—17 years). " I don't know the reason why we come here, but I think it is a waste of time as I'd rather be at work " (boy—16 years). " Your guess is as good as mine for the standered would not help you pass the qualifying never mind still Civil Service exams " (boy—15 years). " We come hear to learn but I don't think it is any use, for we get music. Music for to help a engineer that will not help very much and woodwork that is for a joiner not for fitter " (boy—17 years).

Positive reasons given showed some awareness of the aims of further education. However, the single reason given most often by the *boys* was that relating to helping them to pass future examinations. This motive was far less significant for the girls ($P < 0{\cdot}01$). The next most frequently given reason among the boys was to refresh their memories and revise what they had forgotten.

The *girls* showed more awareness of the value of Further Education as a training in citizenship and preparation for adult life. Statements indicating this were made significantly more often by the girls than by the boys ($P < 0{\cdot}01$). Other reasons suggested more often by the girls were—to help them in their jobs, to meet other people, to learn new interests, and to keep healthy. Undoubtedly the young girl who suggested that she was at the College to be trained in manners and good speech was gaining something of value from her experiences.

Some Examples of Positive Reasons Given.—" I think it is a good college . . . the teachers here are all good fun and they can take jokes " (boy—15 years). " I look forward a great deal to coming to this college . . . I really enjoy every subject here, because I feel its really worth while what they teach you here. It's more or less helping you to live a better life " (girl—16 years). " To make better intellect people of the community " (boy—15 years). " To learn more about the facts of life and its hardships " (girl—16 years). " Every boy and girl should be at school till they are 18, but of course, this is not possible. So when the average boy or girl is 15 they are taken from school and put to work. By this they are robbed of part of their childhood. I think College tries to restore this " (girl—17 years). " Coming to College is, I think, a wonderful opportunity. Not only are we learning more, but we are being helped in every possible way to

better ourselves" (girl—17 years). "I think it is a very good thing it gives the boys more of a grip of the things they will need" (boy—16 years). "I have a great future, but first of all I need Education and at my age College is the best thing for me" (boy—16 years). "It makes the young person who has just left school think that life is not just so hard" (girl—16 years).

Many of the students made incidental critical comments on the work of the College in the course of their essays. Some asked for such things as: "more practical work, and out-of-door activities," "more mixed classes," "shorter hours." A few complained that the standards of work were too low, and many wanted the studies to have a vocational bias,[1, 2, 3] e.g., ". . . boys dealing in locomotives could be taught all about them." The function of the College is clearly *not* to provide vocational training, but if the enthusiasm of these young workers is to be aroused for social and cultural studies their undoubted preoccupation with vocational interests could be made the starting point for an extension of knowledge and understanding. The history and economic and social implications of the locomotive, might well provide an excellent commentary on the development of our industrial civilisation.

Views on Compulsory Further Education.—An investigation of the students' views on whether Further Education should be compulsory, produced the following results:

TABLE X

SHOULD FURTHER EDUCATION BE COMPULSORY?

Age in Years	In favour of Compulsory F.E.		Against		Indifferent		Totals	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
15	29	5	33	9	—	—	62	14
16	45	19	59	23	4	2	108	44
17+	23	31	36	55	1	6	60	92
	97	55	128	87	5	8	230	150

It can be concluded with reasonable certainty that the figures for boys show them to be against *compulsory* further education ($P = \cdot 05$ to $\cdot 02$). The girls were definitely against it. ($P < 0 \cdot 01$.)

Things Missed Since Leaving School.—This part of the investigation was used to throw light on the students' feelings about Further Education, which might be related to earlier experiences of education. The things missed varied from "nothing" to a catalogue of seven or eight.[4] They included school subjects, sports activities, personal and social ties, and conditions associated

[1] VALENTINE, C. W.: "Adolescence and Some Problems of Youth Training," *Brit. J. of Educ. Psych.*, Vol. XIII, Pt. 2, emphasised the importance of taking into consideration when planning curricula, the great interest of adolescents in their future careers.

[2] At Rugby Day Continuation College 60 per cent. of the boys and 40 per cent. of the girls of 16 to 18 years were primarily interested in *Technical* education. WHEELER, O., *op. cit.*

[3] Also WALL, W. D., *Brit. J. of Educ. Psych.*, Vol. XV, Pt. 3, in which it is stated that both sexes among young industrial workers showed a marked preference for activities with an apparently vocational significance.

[4] Cf. TENEN, C., *op. cit.* where young workers indicated they missed the protection of the school environment and the opportunities for play.

with school, such as long holidays and free milk (cf. later quotations). Table XI gives a general picture of how the students felt on leaving school.

TABLE XI

ATTITUDE TO LEAVING SCHOOL.

Age in Years	GLAD to leave		SORRY to leave		INDIFFERENT		Totals	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
15	28	5	22	3	12	6	62	14
16	51	15	36	21	21	8	108	44
17+	27	37	24	35	9	20	60	92
Totals	106	57	82	59	42	34	230	150

It is safe to say only that about as many boys and girls were sorry as were glad to leave school. The observed differences are not significant (P=0·2 to 0·1).

TABLE XII

THINGS MISSED SINCE LEAVING SCHOOL.

	Lessons and Activities	Social and Personal	Benefits and Conditions	Negative	Total
Boys (230) ..	139	67	275	38	519
Girls (150)	110	115	116	17	358

The most prominent category of items missed by the boys related to benefits and conditions, such as short hours and long holidays. Girls missed these things too, but to a significantly smaller extent. (P=·01). They missed the personal relationships and social features of school life, e.g., friends, teachers, cheery atmosphere, far more than did the boys (P=·01), and quite as much as they did the benefits and conditions of school days. This is interesting when related to the fact mentioned earlier that they gave as motives for choosing their jobs, " satisfactions," such as those derived from friendly companions or supervisors. The boys seemed to miss lessons and activities far more than they did the personal relationships and social features of school life.

Illustrations of Things Missed since Leaving School.

Negative.—" I don't think I miss anything as I was glad to leave " (boy—16 years). " The things I missed were bad things as far as I'm concerned. Sitting in a dull class-room all day is not good for anybody " (boy—15 years). " I never missed much when I left school . . . they hammer things like algebra, geography and other sorts, into your head, at College it's up to yourself " (boy—17 years). " Except for the friends I made, I hated every minute of school " (girl—17 years).

Positive.—" My place in the football team. Some pleasant evenings in the Science Lab. A good sleep while Wee Bennett was reading Shakespeare " (boy—15 years). " After I had left school I felt I had missed an awful lot of things, such as gym., sport, science and so on " (boy—16 years). " I missed . . . the easy-going way in which you treated financial affairs, and food crises, war and such things. It seemed all to rest on the elders, but when you start to work,

you have to take your part in these things and it's just taken for granted that you're old enough to understand " (girl—16 years). " The first thing I miss is the cheery atmosphere " (boy—16 years). " The thing I missed most . . . was my school friends. We used to have terrific fun having inter-class fights and inter-school sports meetings and I would like to suggest College do likewise " (boy—15 years). " Most of my pals. Running about in a group doing anything mischievous we could think of " (boy—15 years). " I wasn't tired when I finished school. I am tired when I finish my work " (boy—16 years). " The things I miss most . . . is the companionship of boys and girls of my own age. At the office you can't discuss . . . how you come to have a puncture when you started out to meet a new boy friend and was half-an-hour late " (girl—17 years). " I missed lots of things. All my teachers were very nice and friendly " (girl—18 years). " I missed all the good laughs we do often got at school " (girl—17 years).

Popularity of Subjects.—The students were asked to comment on the subjects they enjoyed most and those they enjoyed least at the College. Half-a-dozen girls stated enthusiastically that they like " all " subjects, and one 17 year old boy said he enjoyed his tea most, but apart from this, far more " likes " were expressed than dislikes.

TABLE XIII

ATTITUDES TO SUBJECTS STUDIED.

	Likes	Dislikes
Boys (230)	570	246
Girls (150) ...	550	157
Totals	1120	403

A method of computing the relative popularity of the various subjects may be achieved by using an *Index of Popularity*, the ratio $\frac{\text{Frequency Liked}}{\text{Frequency Disliked}}$

TABLE XIV

INDEX OF POPULARITY.

	Boys		Girls	
Rank	Subject	Index of Popularity	Subject	Index of Popularity
1	Sport	16·4	Music.....	39/0
2	Music.....	9·9	Crafts	12
3	Art.....	4·5	English and Social Studies	9·4
4	Gardening.....	4	Sport	9·2
5	English and Social Studies	2·9	Art.....	6·75
6	Crafts	2·8	General Home Economics	6
7	Woodwork	2	Cookery	5·6
8	Speech Training	·73	Speech Training	1·5
9	Calculations	·64	Sewing	·97
10	Metalwork	·5	Calculations	·64

for each subject. This cannot be used for accurate statistical purposes, e.g., the position of Gardening in the ranked table below is unreliable because of the small numbers involved (cf. Table XIV). Correlation of boys' and girls' rankings is obviously not practicable since not all subjects were taken by both sexes.

The data from which the Index of Popularity of subjects was calculated are contained in the following table :

TABLE XV

POPULARITY OF SUBJECTS.

	Boys		Girls	
	Like	Dislike	Like	Dislike
Sports	148	9	83	9
Practical :				
Art	54	12	27	4
Crafts	14	5	24	2
Woodwork	36	18	—	—
Metalwork	15	30	—	—
Gardening	4	1	—	—
General Home Economics	—	—	18	3
Cookery	—	—	62	11
Sewing	—	—	30	31
Theoretical and " Cultural " :				
English and Social Studies	120	41	113	12
Speech Training	25	34	33	22
Calculations	55	86	38	59
Music	99	10	39	0

" Sports " was the most popular activity among the *boys*, but English and Social Studies equalled this for popularity among the *girls*. Of the " Theoretical and Cultural " subjects, *English and Social Studies* received more positive votes from both sexes than any other subject, though the smaller number of negative responses to Music gave it a higher Index of Popularity.

Among those of both sexes mentioning *Speech Training*, about as many disliked as liked it.

Calculations tended to be unpopular among the girls commenting on it ($P = \cdot 05$ to $0 \cdot 2$) but was significantly disliked by the boys commenting on it. ($P = \cdot 01$).

Practical Subjects were significantly more often liked than disliked by both boys and girls.[1]

Art—of those expressing a preference, was significantly liked by girls and boys.

Crafts—of those expressing a preference, was significantly liked by girls.

Woodwork—taken by boys alone in this group, was significantly liked by boys.

Metalwork—taken by boys alone in this group was disliked to an extent which approaches significance. ($P = \cdot 05$ to $\cdot 02$.)

[1] WALL, W. D., *Brit. J. Educ. psych.*, Vo. XV, Pt. 3, *op. cit.*, found similar preferences.

Home Economics—taken by girls alone, was significantly liked, but as many disliked sewing as liked it.

A word of caution is required in interpreting the figures expressing preferences for some of these subjects, since they are small. However, they give some indication of young workers' reactions to further education. The students themselves threw some light on this by their *unsolicited* comments. Some for instance, criticised the " low standards " or said that the work was too elementary. Many of the boys were apprentices at a large, heavy engineering firm, and expressed the view that the equipment in the College workshop was inferior to that with which they were used to working. Those who enjoyed a subject sometimes gave clues to their reasons, e.g., " I like Music, because of the civil and understanding teacher " (boy—15 years). " I like English, you're not so nervous ; no tests and no punishment " (boy—15 years).

It would, of course, be rash to generalise from these findings, since the reasons for the attitudes expressed are obviously far from simple, and will vary from group to group and from place to place. These reasons included " hang-overs " from school which may cause such emotional blockages in connection with certain subjects, as to make the student resistant even to new and satisfactory approaches. The personality of the teacher and his handling of these groups of adolescent workers is undoubtedly of the greatest importance. It does seem, however, that if subjects are to " get across," they must be clearly shown to have their origin in the students' present vocational and social needs.

Suggestions for an Ideal Time Table.—Students found this difficult and required explanations. They were expressly told they could suggest *any* subject they would like to study, not necessarily subjects already on the time table of the College. The resulting picture was orthodox and conventional. A few suggestions were made, e.g., for Languages, Sex Education, Photography, Cycling, Ice Skating, Conjuring, Use of Machine Tools, Beauty Culture, and Bible Reading, but these were each mentioned only once or twice. There were a number of suggestions for more recreational facilities, e.g., billiards, radio and gramophone. Other gratuitous suggestions included " longer lunch hour," " shorter hours," and even " hot baths ".

Ten students said they felt a need for the opportunity to read quietly on their own. When this is taken together with the fact that some mentioned that they missed the chance to study, there is a positive indication of the need for a library and ' quiet room.'

Sex of Teaching Staff.—The answers to the questions on this point showed that the *vast majority of both sexes* preferred to be taught by a staff made up of *both men and women.* 78 per cent. of the boys and 88 per cent. of the girls voted thus. The difference is not significant.

Conclusions on Educational Interests.—What emerges is that the young workers, far from bursting with positive suggestions, require a lead to help them develop their interests. Their relative inarticulacy on these points underlines the importance of further studies designed to elucidate these needs and interests. It also underlines the opportunites for creating and sustaining *new interests,* between the ages of 15 and 18.

They need, moreover, to feel some sense of achievement in the more *theoretical* subjects. They enjoyed discussion, but sometimes felt discontented if they saw no results. The clamour for examinations and certificates, in itself bad, may rest on a deep need to feel a sense of progress and mastery of a subject.

In practical work results can be seen. Some feelings of dissatisfaction with the standards of some of the theoretical subjects taught, may be linked with this very need for goals and targets, particularly important to an adolescent, unsure of himself in so many spheres. The experimental introduction of " projects " at this College, with a certificate of recognition for all who made a reasonable sustained effort, seemed to go some way towards meeting this need for a tangible proof of attainment.

It is now an agreed principle of industrial psychology that the worker who *knows* his past record in a given job has an incentive to improve. It is evidently important to evolve ways and means, appropriate to the adult world, which would give these young workers a sense that further education is helping them to *make progress*, whether in sport, in handwork, in social activities, or in intellectual achievement.

(To be concluded.)

AN EXPERIMENTAL EVALUATION OF REMEDIAL EDUCATION

By WM. CURR and N. GOURLAY
(*Department of Education, University of Birmingham*).

I.—*Object of experiment.* II.—*Other investigations.* III.—*Remedial education in Birmingham.* IV.—*The experiment.* V.—*The results.* VI.—*Summary and conclusions.* VII.—*Appendix.*

I.—Object of experiment.

Local education authorities are increasingly disposed to regard the provision of remedial teaching for retarded children as an essential part of the educational system. It is, therefore, more important than ever that we should try to obtain precise answers to two fundamental questions :

(*a*) What measure of success can we hope to obtain from remedial education ?

(*b*) How can we select the children most likely to profit from such treatment ?

Where remedial schemes form part of the educational provision of a local authority, it is customary for children to be selected on the results of a battery of group tests of intelligence and attainment, the criteria of suitability for remedial teaching being (i) discrepancy between mental age and attainment age and (ii) average or superior intelligence. Thus the cases selected have usually been fairly bright children, whose attainments—though not infrequently up to the level of their school class, or of their chronological age—fall short of their mental level. The investigation here reported was originally intended to test the effectiveness of this method of selection, and particularly to meet the criticism frequently made by class teachers, that the screening procedure is unnecessary, and that the class teacher, on the basis of knowledge of the pupils' daily work, could, in fact, select a group who would make better progress under remedial teaching than those chosen by scrutiny of the results of objective tests. When, however, the design of the experiment came to be considered, it was immediately realised that the investigation would also provide an answer to the first of the two questions above.[1]

II.—Other investigations.

The continued paucity of objective evidence on the results of remedial teaching was the subject of a footnote by the editor of the journal in introducing a report by Birch[2] on the results of the scheme for the improvement of reading ability, undertaken by the Borough of Burton-upon-Trent in August, 1947. Using group tests of intelligence and standardised tests of reading ability (in particular the Schonell Graded Word Vocabulary Test), Birch selected children showing retardation in reading, and following two years' operation of an intensive scheme of remedial teaching, supplemented by a programme of lectures and exhibitions designed to stimulate the interest and co-operation of

[1] The same statistical analysis, in fact, answers both problems and is an example of the value, in this field, of the technique of analysis of variance which Burt and Lewis advocated as being particularly appropriate in this type of investigation. Burt, C., and Lewis, B. : " Teaching Backward Readers," *Brit. J. Ed. Psych.*, 1946, 16, pp. 116-132.

[2] Birch, L. B. : " The Improvement of Reading Ability," *Brit. J. Ed. Psych.*, 1950, 20, pp. 73-76.

teachers, he was able to report an increase of 1·2 years in the average reading age of children entering the secondary modern school, and a reduction from 40 to 16 per cent., in the number of children showing two years' retardation. In an earlier article,[1] reporting the gains made by seventy-two children who had been attending the Burton Remedial Centre for six months, Birch showed that the sixty-four children for whom complete data were available had made an average of 1·9 years progress in reading—almost four times the expected rate. By the use of similar methods of remedial education in a child guidance centre, H. B. Valentine[2] found that twenty-five children of mean I.Q. 87, who attended over a period of ten months, and received two hours of remedial teaching per week, made an average gain of eighteen months in reading age. In arithmetic, fifteen children of average I.Q. 83, after receiving two hours' special teaching each week over an eight-month period, showed an average gain of two years. These increases, bearing in mind the intelligence level of the children concerned, represent three or four times the progress that could have been expected in a similar period under ordinary classroom conditions.

The remarkable successes achieved by these investigators have naturally tended to stimulate still further the growing interest in the possibility of reducing the incidence of educational retardation by intensive remedial methods, and additional evidence of the satisfactory results of this type of treatment is to be found in the progress reports of the numerous Remedial and Psychological Services now in operation. These reports usually quote the results of remedial treatment in the form of statements of initial and final status, in terms of attainment age. Such evidence, however, in the absence of proper experimental design and statistical analysis fails to discriminate genuine improvement in attainment from a number of spurious effects which, if properly allowed for, might reduce considerably the apparent gain.

The practice effect arising from the re-application, at the end of the period of treatment, of the tests applied at the beginning, is too familiar to require elaboration, but it must be remembered also that the final test score may be considerably raised, not only by the practice gained during the first administration of the test, but also by transfer to the test-material of the skill gained by the continual use and familiarity, during the period of remedial treatment, of teaching material very similar in type to that of which many standardised tests are constructed. Some evidence of the occurrence of this factor was found in the present investigation.[3]

[1] BIRCH, L. B.: "Remedial Treatment of Reading Disability," *Educational Review*, 1949, 1, pp. 107-118.

[2] VALENTINE, H. B.: "Some Results of Remedial Education in a Child Guidance Centre," *Brit. J. Ed. Psych.*, 1951, 21, pp. 145-149.

[3] A further cause of inflation of progress estimates based on difference between test and retest—and one which is often neglected, although Philpott, in two articles, has emphasised its importance—is the fact of statistical regression. (PHILPOTT, S. J. F.: "Fallacious Arguments from Experiments in Methods of Teaching," *Brit. J. Ed. Psych.*, 1945, 15, pp. 57-69, and "Cinema Commission of Enquiry Experiment—A discussion of Experimental Methods," (*Brit. J. Ed. Psych.*, 1946, 16, pp. 32-48.)) If a group of pupils is subjected to two tests separated by an interval of time which may be anything from a few minutes to a matter of months or years, pupils at any level below average in the first test will always achieve a higher mean level (relative to the group) in the second test (it being understood that, during the interval, none of the pupils will have received any differential treatment, or if such has taken place, allowance for it has been made.) The improvement in performance is a function of the imperfect correlation between the two sets of test results for the group: the smaller the correlation, the greater the gain. Only in the case of perfect correlation would there be no improvement, but since perfect correlation never exists in educational practice, it follows that remedial education—if evaluated by the difference between test and retest—will always show a gain with pupils below average, even when it is no more beneficial than ordinary class teaching.

III.—REMEDIAL EDUCATION IN BIRMINGHAM.

Particularly favourable conditions for the investigation of the problems outlined above exist in the Education Department of the University of Birmingham. The Remedial Education Centre, founded in 1948, as a section of the Research Department of the Institute of Education, had as its chief purpose the provision of facilities for research into problems associated with educational retardation, and for the training of students in methods of diagnosis and remedial treatment. The simultaneous development of the Ministry of Education's plans to provide courses for teachers of not less than five years experience, who wish to equip themselves for work in teacher-training colleges, or for advisory posts with local education authorities, has brought into the Department each year a group of about twenty students, already qualified and experienced in classroom work, to undertake a one-year full-time course leading to the award of a Diploma in the Psychology of Childhood. In view of the facilities available in the Remedial Education Centre, and the widely-known work of Professor Schonell in the field of retardation and remedial teaching, it has been natural that the practical work which forms one of the major requirements of the Diploma Course has tended to be biassed towards work with children of good intelligence who show retardation in the basic subjects. While some students have, of course, had a vocational interest in this field, it has been for all a useful training ground in which to observe and test the applications of the theoretical work of the course. Thus an opportunity for an experimental evaluation of remedial teaching arose from the unusual circumstance of having a fully-equipped remedial education service, similar to that provided by many local education authorities, and operated by a team of experienced teachers, working under the auspices of a University Department of Education.

IV.—THE EXPERIMENT.

(*a*) *Preliminary planning and testing.*—As already stated, the method commonly used for measuring the effect of remedial education is to test the retarded pupils both before and after the period of instruction (by means of standardised tests) and to take the resultant increase in attainment age (minus the time between testings) as a measure of the gain due to the instruction. In the present investigation, use was still made of this test-retest procedure, but provision was made for the statistical control of practice effect and regression by (i) matching the pupils undergoing remedial instruction with pupils of more or less equal attainment and intelligence (also in most cases of same sex and with same class teacher) and (ii) subjecting both the remedial and the control groups to the same tests throughout the experiment. How an attempt was made to allow for the third spurious factor—the possibility of the remedial instruction being a form of ' coaching ' in the type of test-material used—will be described later.

The discerning reader will note that the first of Birch's investigations mentioned above, does not take the form of quoting the initial and final status for the *same* group of pupils. Consequently, the spurious inflation of gains due to statistical regression cannot occur. But the factors of practice effect and coaching in a particular type of test are still involved, although it is probably true to say that the first of these factors—practice effect, does not amount to as much in the Schonell Graded Word Reading Test (used by Birch) as it does in the Schonell Reading Comprehension Tests (used by us). Also, investigations which rest on the difference between groups belonging to different years, while avoiding regression effects, suffer to an increased degree from the defect (of which Birch shows himself to have been aware) that the experimental design provides no adequate control of extraneous factors such as general improvement in school conditions.

Eight primary schools were available for the experiment, and in accordance with the usual practice at Birmingham, two student-teachers were assigned to each school to share the instruction of eight pupils. Since one of the objects of the experiment was to compare the progress under remedial teaching of (*a*) pupils selected by means of tests, and (*b*) pupils chosen by the class teachers, it was decided that the remedial group in each school would consist of four test-selected pupils and four teacher-selected pupils.

The first step was, therefore, to carry out a mental survey of the eight schools. Only the eight-year-olds were tested. The tests used were :

Sleight Non-verbal Intelligence Test ;
Simplex Junior Intelligence Test[1] ;
Schonell Reading Comprehension Test (Form A) ;
Schonell Mechanical Arithmetic Test (Form A) ;
Schonell Spelling Test.

From the test results, a list was drawn up for each school of the names of those pupils who were of normal or above normal intelligence, according to the Sleight test, but who were considerably retarded (again relative to the Sleight) in their performance in the Schonell tests. The names on each school list were arranged in order of degree of retardation of the pupils.

At the same time, the teachers of classes involving eight-year-olds were asked to make out for their respective classes a list of names of pupils who were, in their opinion, most likely to benefit from remedial instruction. Each teacher was also asked to arrange the names of her pupils in order of priority.

Eight children were then selected in each school to form the remedial group—four from the school lists based on the test-results, and four from the teachers' lists. Where there was no overlap of names, the procedure was simple : the top four pupils on the teacher's list for that class were selected, etc. Where an overlap between lists existed, it was arranged that those pupils who would have been selected by both tests and teachers were divided equally between the test-selected and teacher-selected groups.

The next task was to select pupils to form the control group for the experiment. This was done by finding for each pupil, selected for remedial education, another pupil who matched the first as closely as possible for attainment and, where possible, for intelligence. The attempt was also made to have each pair of pupils of the same sex and with the same class teacher : there were a few cases where this was impossible.

Table I shows the means for the test-selected and teacher-selected remedial groups and their control groups in the initial testing. The following observations might be made :

(i) While there is little difference in attainment between test-selected and teacher-selected pupils, they differ considerably with respect to Sleight M. A. (nearly two years) and to a certain extent (about half-a-year) in their M. A. as measured by the Simplex Junior. This would appear to support the view generally held by educational psychologists that teachers are not the best judges of intelligence and, therefore, suitability for special instruction.

(ii) The lower performance of both groups of pupils on the Simplex test in relation to the Sleight illustrates the point that verbal I.Q. is not a good measure of intelligence when scholastic attainment is low.

(iii) The means for the remedial groups and their controls agree very closely. There is one exception—the rather large discrepancy between the mean

[1] This test was not used in selecting children for the remedial groups, but the results obtained may be of interest to the reader. (See Table I.)

Sleight M. A. for the test-selected group and that for its control. The reason for this is obvious. Since the test-selected pupils were those showing the greatest divergence between Sleight M. A. and attainment age, it was impossible to find other pupils who could match them in both attainment and the Sleight : matching could be done only on one of the two. Here matching was done on attainment and the discrepancy between mental ages kept as small as possible.[1]

(*b*) *Pre-instruction testing.*—Before the commencement of instruction for the remedial groups, all groups, both remedial and control, were subjected to a second battery of tests, comprising :

Schonell Reading Comprehension (Form B) ;
Schonell Mechanical Arithmetic (Form B) ;

and three unstandardised tests in reading, arithmetic and spelling, which were constructed by three of the student-instructors. It was this battery of tests (supplemented by the Schonell Spelling Test), which was to provide, for the final statistical analysis, the necessary measures of gain due to instruction.

Several reasons may be given for this second testing :

(i) There is the obvious point that the second testing and the initial testing were a check on each other.

(ii) It was a good thing to have this additional testing in order that the control groups should not (in the final testing) be at a disadvantage in relation to the remedial groups through lack of familiarity with the test situation, and with the remedial teachers.

(iii) By including unstandardised tests in the battery, the attempt was now made to allow for the possibility that remedial instruction provides a training in the use of test-material peculiar to the standardised type of test, and that this skill does not transfer to reading ability in general, and would, therefore, not improve performance in other types of test in the same subject. In the case of reading, it was comparatively easy to design an unstandardised test rather different from the Schonell test. The test used gave a joint measure of the child's ability to read a story aloud and to answer orally questions put by the tester on what had been read. With tests in arithmetic and spelling, it is not possible to produce any great variation in design. The unstandardised tests in these subjects acted mainly as a simple check on the corresponding Schonell tests.

Table II gives the means for all groups in the second testing. Once again there is a close agreement between remedial groups and their controls. But the most interesting point is the considerable increase in Schonell Reading Age as we go from Table I to Table II. As there were only about eight weeks between

[1] This at first sight may appear a defect in the design of the experiment. It might be argued that if the test-selected pupils should, after remedial instruction, prove superior to their controls, this difference need not be attributed to the instruction but to initial differences in intelligence. Certainly, in the ordinary methods experiment, no one would consider a comparison of two methods on the results obtained from teaching two groups showing initial systematic differences in intelligence : factors such as intelligence have to be randomised in order that a fair comparison might be made. But the situation is different in the present case. The primary claim for remedial instruction is that it takes the retarded pupil of normal or superior intelligence and utilises that intelligence to raise the standard of the pupil's school work : if no such effort is made for this type of pupil, his intelligence will remain untapped and he will show no greater advance in school work than any other pupil of similar attainment level but less intelligence. Consequently, any superiority which the test-selected pupils may show after a period of remedial instruction and which may be attributed at first sight to the difference in intelligence, is really due to the remedial instruction which has brought the difference in intelligence into operation.

There are several statistical niceties which could be introduced into the discussion of this point, but they would take up too much space here.

the two testings, the interval between tests is no explanation. Also, while it was Form A that was applied on the first occasion and Form B on the second ; it would require some gross inaccuracy of standardisation for the difference to be attributed to the change of test form. The obvious explanation is practice effect. Further evidence of practice effect was obtained when all the groups were tested at the end of the remedial instruction course (compare Tables II and III).

Somehow, no correspondingly large increase was obtained with the two Schonell Arithmetic tests, although there was evidence of considerable practice effect when, in the final testing, Form B was administered for the second time.

With the completion of the testing, remedial instruction was begun. In each school, instruction was given for two mornings per week. For the rest of the week, the children had ordinary lessons in their own classes. The remedial teaching programme was spread over two terms, the total number of teaching weeks being, on the average, fifteen, representing approximately seventy-five hours of teaching time which was devoted chiefly to intensive individual work in reading, spelling and arithmetic, with such additional creative dramatic work, painting, puppetry, etc., as the students considered desirable to maintain interest and stimulate effort in the basic subjects.

It might also be mentioned here that before the student-instructors embarked on this programme, they were told not to make any distinction between test-selected and teacher-selected pupils : both were to receive the same treatment.

(*c*) *Final testing* (*after remedial instruction*).—With the completion of the remedial instruction programme, all groups, remedial and control were subjected again to the same battery of tests as had been used for the pre-instruction testing, supplemented by the Schonell Spelling Test. It was also arranged that the testing of pupils within a school was not done by the two students who had been teaching in that school : there was a change-over of students between the schools for this third testing.

The means obtained are shown in Table III. But it must be pointed out that in this third testing the means are no longer based on 32 pupils per group. Several pupils were not present for the testing owing to illness and there were two pupils in one school who had left for another district.

V.—The results.[1]

The means of Table II were subtracted from their counterparts in Table III to give the mean gains for the four groups in each of the six tests. These mean gains are shown in Table IV. Also recorded in Table IV are the differences between the mean gains for the remedial groups and their controls.

If we consider now our first question, " Does remedial education raise the scholastic performance of pupils receiving such education ? " the following observations might be made :

(i) In all but two cases, the remedial groups achieved a higher mean gain than did their controls. The two exceptions are the results in the two spelling tests for the teacher-selected remedial group and its control.

On the other hand the differences between the mean gains for the remedial and control groups are disappointingly small.

(ii) The largest mean gain difference obtained (the only difference to reach the 5 per cent. level of significance) is that between the test-selected remedial group and its control in the Schonell Reading Comprehension test.

[1] In this section, a very simple statistical account is given of the results of the experiment. For the reader who would like to know something of the statistical analysis to which the experimental data were subjected, a brief appendix is provided.

But the result is offset by the negligible difference between the gains for the same groups in the unstandardised reading test. This would suggest that there is something in the theory that remedial instruction develops skill in answering one type of reading test, but the skill does not transfer to other types of reading performance.

(iii) The deterioration in the spelling tests for the teacher-selected remedial group and its control are of interest. If these differences had reached an accepted level of significance, it might have been concluded that for backward pupils who have not a mental capacity considerably above their attainments, ordinary class-teaching in spelling is more effective than remedial instruction of the type given in this experiment.

When we turn to the second problem, " Do test-selected pupils do better under remedial instruction than teacher-selected pupils? " we want now to compare the mean gains obtained by test-selected pupils relative to their controls with the corresponding mean gains obtained by teacher-selected pupils relative to their controls, i.e., we must examine the " differences between differences." Once again the means obtained, with the exception of those for the unstandardised reading test, point to an affirmative answer, but it is only in the case of the unstandardised spelling test that the difference between test-selected and teacher-selected pupils (relative to their controls) proves significant (at the 5 per cent. level). This result, however, is of doubtful value, because, on testing the gains of the test-selected and teacher-selected pupils *separately*, each against their own controls, no significance was obtained.

Before we conclude this section, it is instructive to compare the means for the Schonell tests in Table III with the corresponding means in Table I. Thus, in reading, arithmetic and spelling, the test-selected remedial group increases its mean attainment ages by 23·5, 16·5, and 11·3 months, respectively, and this over a period of only about six months. Such a result, stated in isolation, is most impressive and the gains in the three subjects are actually of the same order as most of those reported in other investigations. But when we observe that the corresponding gains for the control group are 18·4, 12·4, and 10·9, the above figures do not appear so remarkable. The explanation for the inflation of the gains is, of course, practice effect and, to a smaller extent, the regression of final on initial scores.

VI.—SUMMARY AND CONCLUSIONS.

The investigation was carried out primarily to discover whether remedial education was more beneficial in the case of pupils selected on the results of intelligence and attainment tests, than in the case of pupils selected simply by the class teachers. But the design of the experiment also permitted the collection of data regarding the effectiveness of a course of remedial instruction such as was here provided.

In the matter of the measurement of the ' true gain ' due to instruction, the experiment differed from most investigations in this field in that it made full allowance for practice effect and the regression of final on initial scores. This was done by the simple procedure of matching all pupils receiving instruction, both test-selected and teacher-selected, with pupils who did not receive instruction and who remained with their class teachers. The ' true gain ' due to instruction was then simply the difference between the mean gains of the remedial groups and the control groups over the period of instruction. Only eight-year-old children were considered in the experiment and remedial instruction was confined to the basic subjects of reading, arithmetic and spelling. The period of instruction itself was spread over two school terms and

consisted of two half-days' instruction per week for about fifteen school weeks, approximately seventy-five hours of instruction in all.

An attempt was also made to see whether the instruction 'coached' pupils only for one kind of test, i.e., developed a skill for one type of test which did not transfer to other types.

The results of the experiment were as follows :

1.—Pupils in the remedial group, selected by the test procedure, showed 'true gains' (as defined above) in reading, arithmetic and spelling, as measured by Schonell tests, cf 4·7, 2·2, and 0·4 months, respectively.

2.—For teacher-selected remedial pupils, the corresponding true gains were 0·7, 1·9, and —4·1 months, respectively.

3.—The differences between the results stated in paras. 1 and 2 are not statistically significant. The experiment therefore cannot be used as evidence to support the view that it is better to use a screening procedure in selecting pupils for remedial instruction than to rely on the class teacher's judgment. Neither, of course, does it disprove this view.

4.—Only in the case of Schonell Reading was the true gain found significant.

5.—The results for the unstandardised tests in reading, arithmetic and spelling differed from the above in one important respect : the gain for the unstandardised reading test was negligible. This would suggest that the instruction had developed a skill for the Schonell Reading Test which had not transferred to the other type of test.

Perhaps the most important consequence of this experiment is the implied challenge to workers in the field of Remedial Education. It must be remembered (1) that the remedial teachers who took part in this investigation—though students in the sense that they were concurrently taking a course of study in psychology—were, nevertheless, qualified teachers of at least five years' previous classroom experience, and (2) that they were selected for the Diploma Course in virtue of previous psychological knowledge and an avowed interest in remedial education—a procedure similar to that adopted by many local authorities in selecting the staffs of their Remedial Services, where teachers are selected on grounds of interest and suitability for the work, any training in Diagnostic and Remedial techniques being given concurrently with their adjustment class teaching. Nor must it be forgotten that, in the course of the experiment, these student remedial teachers did, in fact, achieve gross improvements in attainment scores quite as high as those usually reported by Remedial Centres working with fully-trained full-time staffs. Inevitably the question arises : would any more impressive results be obtained if the gross increases in attainment scores, claimed by fully-trained remedial teachers or by psychologists carrying out remedial teaching in a School Psychological Service, were converted to 'true gains' after the manner of this investigation? This is a challenge which is difficult to ignore, and the writers of this article, for their part, would like to see a further inquiry along these lines.

VII.—Appendix.

STATISTICAL ANALYSIS OF EXPERIMENTAL DATA

The statistical procedure adopted was an analysis of variance of gains. The obvious alternative is an analysis of covariance but under certain conditions, here satisfied, it can be shown that an analysis of variance of gains has nearly equal precision.[1]

[1] Mr. Gourlay intends to elucidate this point in a later paper dealing with statistical precision and the analysis of covariance.

To illustrate the form the analysis of variance took in the given case, the analysis of the gains for the Schonell Reading Comprehension test is reproduced in Table V (the number of degrees of freedom for the residual variance is less than the 96 expected owing to absenteeism).

The answer to our first problem—what success can remedial instruction achieve ?—is obtained by considering the treatments variance. If we test *treatments* against the residual (within pairs) and obtain some level of significance, we have a result which holds only for the group of remedial teachers, class teachers, etc., employed in this experiment. To obtain a generalised result, we must test *treatments* against T × S or, if it is believed on a priori grounds that T × S and T × Sel × S are estimates of the same variance (and if the data support this view) we may test *treatments* against a combination of these two variances and so obtain a greater precision.

The answer to our second problem is obtained by testing T × Sel in much the same way as *treatments*—against the residual (within pairs) for the particular result, and against T × Sel × S or a combination of T × S and T × Sel × S for the generalised result. Actually, if T × Sel proves significant in either of these cases, the corresponding test for *treatments* should be made for the two types of selection separately.[2]

In the case of the analysis of the Schonell Reading Comprehension Test (see Table V) the variance T × Sel does not reach the 5 per cent. level of significance, even when tested against the residual (within pairs) variance. On the other hand, *treatments* proves significant at the 5 per cent. level against the pooled variance of T × S and T × Sel × S (and at the 1 per cent. level against the residual within pairs).

As stated in Section V of the paper, the only other analysis to produce a significant result was the analysis of the unstandardised spelling test where the variance T × Sel proved significant at the 5 per cent. level against the pooled variances T × S and T × Sel × S (and against the residual within pairs). But, when, in accordance with usual practice, *treatments* was tested separately for the two types of selection, no significant result was obtained.

TABLE I

MEANS FOR REMEDIAL AND CONTROL GROUPS IN SCHOOL SURVEY (INITIAL TESTING)

	Test-selected Pupils		Control Group		Teacher-selected Pupils		Control Group	
	yrs.	mths.	yrs.	mths.	yrs.	mths.	yrs.	mths.
Age	8	5·0	8	5·4	8	5·3	8	5·5
Sleight Non-verbal	9	9·8	8	8·4	7	11·7	7	9·0
Simplex Junior	7	6·5	7	6·6	7	0·8	7	0·8
Schonell Reading Comprehension (Form A)	7	1·3	7	0·8	7	3·2	7	1·4
Schonell Mechanical Arithmetic (Form A)	8	0·2	7	11·6	7	6·1	7	8·0
Schonell Spelling	7	1·7	7	3·9	7	1·1	7	2·7

[2] The reader who would like a fuller discussion of the above is referred to E. F. LINDQUIST's *Statistical Analysis in Educational Research*, where a rather similar problem is treated in considerable detail (pp. 173-177).

TABLE II

MEANS FOR REMEDIAL AND CONTROL GROUPS IN SECOND TESTING (BEFORE REMEDIAL INSTRUCTION).

		Test-selected Pupils	Control Group	Teacher-selected Pupils	Control Group
S.R.C. (Form B)		yrs. mths. 7 11·6	yrs. mths. 7 10·8	yrs. mths. 7 7·8	yrs. mths. 7 9·0
S.M.A. (Form B)		8 3·7	8 1·3	7 7·4	7 9·9
Unstandardised Tests	Reading	25·3	25·5	22·0	22·1
	Arithmetic	10·6	10·0	7·9	8·6
	Spelling	40·1	43·7	38·8	42·0

TABLE III

MEANS FOR REMEDIAL AND CONTROL GROUPS IN THIRD TESTING (AFTER REMEDIAL INSTRUCTION).

		Test-selected Pupils	Control Group	Teacher-selected Pupils	Control Group
S.R.C. (Form B)		yrs. mths. 9 0·8	yrs. mths. 8 7·2	yrs. mths. 8 3·8	yrs. mths. 8 4·3
S.M.A. (Form B)		9 4·7	9 0·0	8 7·4	8 8·0
Schonell Spelling		8 1·0	8 2·8	7 7·6	8 1·2
Unstandardised Tests	Reading	31·1	31·0	27·3	27·0
	Arithmetic	16·5	14·7	11·8	12·5
	Spelling	56·8	58·7	45·8	52·0

TABLE IV

MEAN GAINS* FOR REMEDIAL AND CONTROL GROUPS IN THIRD TESTING (AFTER REMEDIAL INSTRUCTION).

		Test-selected Pupils	Control Group	Mean Gain Difference	Teacher-selected Pupils	Control Group	Mean Gain Difference
S.R.C. (Form B)		months 13·2	months 8·5	months 4·7	months 7·9	months 7·2	months 0·7
S.M.A. (Form B)		12·9	10·7	2·2	12·0	10·1	1·9
Schonell Spelling		11·2	10·9	0·4	6·5	10·6	–4·1
Unstandardised Tests	Reading	5·8	5·6	0·2	5·3	4·9	0·4
	Arithmetic	5·9	4·7	1·2	4·0	3·9	0·1
	Spelling	16·7	15·0	1·7	7·0	10·0	–3·0

* Gains have been calculated relative to second testing, except in case of Schonell Spelling Test, where gains have been calculated relative to results on initial testing.

TABLE V

ANALYSIS OF VARIANCE OF GAINS FOR SCHONELL READING COMPREHENSION TEST (FORM B).

	d. f.	Sum of Squares	Variance
Treatments (T)	1	349·69	349·69
Selections (Sel)	1	156·25	156·25
Schools (S)	7	2871·49	410·21
Treatments × selections (T × Sel) ..	1	98·03	98·03
Treatments × schools (T × S)	7	554·31	79·19
Selections × schools (Sel × S)	7	513·00	73·29
T × Sel × S.....	7	450·22	64·32
Residual { Between pairs	34	3535·75	103·99
Residual { Within pairs	34	1544·25	45·42
TOTAL	99	10072·99	—

Comments on the Article, "An Experimental Evaluation of Remedial Education," by Wm. Curr and N. Gourlay

By L. B. BIRCH
(*Lecturer in Educational Psychology, University of Sheffield Institute of Education*).[1]

The main conclusion to be drawn from this article is that, with the methods of remedial education and of testing employed *in this experiment*, the gains in ability in reading, arithmetic and spelling were little greater than they were in the control pupils who continued to be taught only by their own teachers. Such apparent gains as were obtained between initial and final tests were due to one or all of three factors; first, practice effect in the tests themselves, second, transfer of skill from the teaching material to the tests, and third, to the effect of statistical regression.

The writers of the article infer that the large improvements reported by previous workers as being due to remedial education, were also probably vitiated by the same spurious gains. The results reported here however, are not really comparable with those generally reported by previous workers as regards reading because Curr and Gourlay used Schonell's comprehension tests while previous workers have usually used the graded word vocabulary tests standardised by Burt, Vernon or Schonell. This probably makes a much greater difference than Curr and Gourlay would apparently wish to concede. First provided that it is correctly used, the graded word vocabulary tests are singularly free from practice effect. Schonell,[2] for example, claims that "there is no likelihood of practice effects vitiating the results of the test" and, in the experience of the writer of these comments, graded vocabulary tests can be given as frequently as at monthly intervals without there being any apparent practice effect.

The second factor responsible for producing apparent gains in Curr and Gourlay's experiment, that of transfer from the teaching material to the tests, would seem unlikely to operate when the test is of the graded vocabulary type. It would be very unusual for any large part of the remedial teaching to consist of the learning of lists of words divorced from their context, and it is difficult to see how appreciable transfer of training could take place from the more usual teaching material to this particular test.

Statistical regression, the third source of error which was quoted, must of course, have entered into many previous reports and certainly into some of the results reported by the present writer from his Burton experiments. However, the size of the error due to regression effect is inversely dependent on the reliability of the tests used for the initial and final testing. Graded vocabulary tests are usually much more reliable than comprehension tests: Vernon[3] gives an estimated reliability coefficient of ·93 for his version, while Schonell[4] states that his test has a coefficient of ·96 so that it would seem that this error too would probably be quite small.

[1] Editor's Note.—As the article by Mr. Wm. Curr and Mr. N. Gourlay bore directly upon a previous article by Mr. L. B. Birch, the latter was invited to submit comments; these are now appended to the article with the willing agreement of the authors. The comments are printed the more readily as they include a reference to the possible special attention of teachers to their 'control' pupils, to which the editor and his editorial colleague had already called attention.

[2] Schonell, F. J.: *The Psychology and Teaching of Reading*, p. 85.

[3] Vernon, P. E.: *Standardisation of a Graded Word Reading Test*, p. 10 and p. 22.

[4] Schonell, F. J., *op. cit.*, p. 85, footnote.

These arguments would seem to indicate that the gains attributable to remedial teaching of reading by previous workers were probably only slightly affected by the three factors to which Curr and Gourlay have drawn attention. This is born out by the fact that remedial teachers frequently use the tests only to give a more precise numerical value to a measure which they already know roughly. They are well aware that their pupils have improved so as to be able to read books of certain levels of difficulty and would not be long deceived into believing that they had much higher reading ages just because a test said so. The arguments fail, however, to indicate why the remedial efforts were so unsuccessful in this experiment and, in particular, they do not explain why the results of the remedial teaching of arithmetic and spelling were so poor for here the results were probably not influenced by the choice of unsuitable tests. Unfortunately, no indication is given of the kind of remedial teaching used nor was the " difference between schools " (revealed by the analysis of variance) investigated to see whether, as seems likely from the size of the difference, some teachers did, in fact, produce substantial gains which were masked in the averages by the poor results of the bulk of the others. There is, however, one further possible explanation of the poor results of remedial teaching in all subject reported in this article.

It was a common experience in Burton, and other workers have frequently found it elsewhere, that when once a teacher has become aware that certain children in his class are working below capacity, many of these children begin to improve. Sometimes the teacher has expressed surprise at the sudden improvement and has said he has done nothing to help the backward children. A more careful consideration will often reveal, however, that this is not strictly true, and in fact, quite a considerable amount of extra attention has been paid to the failing children. In this experiment by Curr and Gourlay it is by no means certain that just this kind of extra help was not given to the control groups so that, in effect, they were possibly getting remedial teaching too. Even if the controls were not being singled out for extra teaching, it is likely that the presence of a remedial teaching experiment in the schools may have interested the teachers in the problem so that by reading and discussion, they improved the general level of their own teaching to such an extent that they were able to bring about substantial over-all improvement. In this case a situation arose by accident similar to that which was deliberately produced in the schools of Burton-upon-Trent and which was probably largely responsible for the increase which we found of 1·2 years in the average reading age of *all* children entering the secondary modern schools in Burton, to which Curr and Gourlay refer in Section II of this article.

A FURTHER STUDY OF ATTITUDE TOWARDS TEACHING AS A CAREER

By KATHLEEN M. EVANS
(Lecturer and Research Officer in the Collegiate Faculty of Education, University College, Cardiff).

I.—Introduction.

Recently this *Journal* contained an account of an investigation by the present writer of the attitude towards teaching as a career of a group of School Certificate candidates.[1] It was found that the attitude scores of pupils in a number of schools did not vary significantly from school to school, and that the scores made by boys and girls were similar. When the attitude test was given to a group of Training College students and to a group of students in a University Training Department, it was found that the latter group had a similar attitude to that of the School Certificate candidates. The Training College students, however, had a significantly more favourable score than either the Training Department students or the school children. A further study has since been made of the attitudes towards teaching as a career of students training for teaching in different colleges. The findings are given here.

II.—Earlier researches.

Earlier researches by Austin,[2] Valentine,[3] and Tudhope[4] are noteworthy in that they lay the foundation for the study of attitude towards teaching as a career. They are concerned with the reasons given by adolescents (school children and students), for the choice of the teaching profession. They study factors which help to determine this attitude, but do not attempt to connect attitude with success in teaching. Indeed, it has not been possible to discover any English study in which this has been done. Among American studies, those by LaDuke,[5] Rolfe,[6] and Rostker[7] are typical. Each of these investigators gave the Yeager Scale for Measuring Attitude to Teachers and the Teaching Profession to a group of teachers and correlated the resulting scores with pupil-achievement measures of teaching efficiency. LaDuke and Rolfe obtained insignificant correlations, but Rostker obtained a significant correlation of 0·45.

In view of these findings and the lack of English research on the subject, it was decided to investigate further the connection between attitude towards teaching as a career and teaching efficiency. The connection, if any, between this attitude and intelligence was also thought to be worth investigating.

III.—Subjects of this study and the tests used.

The subjects of this study were the students in four Training Colleges and a University Training Department. Two of the colleges, A and B, are two-year colleges for women. College C is a two-year college for men. College D is a women's College of Domestic Arts offering a three-year course of training.

College E is a mixed University Training Department offering a one-year post-graduate course. In Colleges A and B the students are divided into groups according as they are intending to teach in Secondary, Junior or Infant schools. No such division is made in the other colleges. All the students in Colleges A, B, C, and D who finished their training in 1951 were tested. In College E only a group of the students was available for testing.

The attitude test has been described in my previous article. It was prepared by the method of Thurstone and Chave, and scored by a simplified Likert technique. For the present investigation, the original test was modified slightly, since a few of the statements used in testing school children were not entirely suitable for testing students who had already entered on a course of training for teaching. In addition to the attitude test, the Moray House Adult (1) Test of Intelligence was given in Colleges A, C, and D. The students in College B had already been given the Cattell Intelligence Test, Scale IIIB, so the results of this test were used in preference to retesting them with the Moray House Test. It was not found possible to give an intelligence test to the group of students from the University College E.

A note on the assessment of teaching ability must be added. Probably the best form for this note is a description of the way in which ratings of practical teaching are made in one of the colleges with which we are concerned. In this college the students have three periods of supervised teaching practice during their course of training. During practice they are observed in the classroom by an Education Lecturer and by other lecturers who act as their Advisers. The Education Lecturer has charge of the same group throughout the whole of the two years of their course, and is consequently responsible for standardisation throughout the group. The Advisers do not usually supervise the same students for all three practices. In addition, the teaching of Music, Art, and Physical Education are supervised by specialist lecturers in those subjects. Thus, during the three practices any one student may be observed by from two to seven lecturers. During the last of the three practices a sample of students is seen by external assessors. At the end of the last practice, Final Teaching Marks are awarded to the students at a meeting of the staff of the college and the external assessors. The Advisers, who have students from all Education groups, standardise between groups. The external assessors ensure standardisation with other colleges whose students they have seen. Modifications of this method of assessment were in use in the other colleges of this investigation.

Since the colleges did not all belong to the same Area Training Organisation, there was no guarantee that the marks awarded in them were all on the same standard scale. For this reason, in the calculation of results each college has been treated separately, and no attempt has been made to work out correlations for the combined colleges.

IV.—PILOT STUDY.

A pilot experiment was first carried out on the students in College A who finished their training in 1950. Analysis of the attitude scores of the Secondary, Junior and Infant students showed that, while the mean score of the Secondary students did not differ significantly from the mean scores of the Junior and Infant groups, the mean score of the Infant group was significantly more favourable than that of the Junior group.

The attitude scores were then correlated with the marks in Practical Teaching awarded to the students at the end of their course. The results are shown in Table I. Only one of these correlations, that for the Secondary students, is significant.

TABLE I

CORRELATIONS BETWEEN ATTITUDE SCORES AND FINAL TEACHING MARKS IN COLLEGE A (PILOT EXPERIMENT).

Group	Number	Correlation
Secondary.....	22	+0·50
Junior	26	−0·043
Infant	26	−0·040
Whole	74	+0·081

V.—THE MAIN INVESTIGATION.

The differences found in the pilot study between the three groups of students in College A showed that the main investigation might be of interest. Accordingly, the attitude test was given in the five colleges already described. The means and standard deviations of the attitude scores of the different groups of students are given in Table II. The possible range of scores was from −40 to +40. It will be seen that the mean scores are all definitely on the favourable side of zero.

The reliability of the attitude test was assessed by giving it for a second time, after an interval of about a month, to the Secondary students in College A. The correlation between the scores on the test and retest was 0·68.

TABLE II

MEANS AND STANDARD DEVIATIONS OF ATTITUDE SCORES.

College	Group	N	Mean	S.D.
A (Women)	Secondary.....	22	20·6	4·64
	Junior	28	20·9	4·38
	Infant	30	23·9	4·15
	Whole	80	21·9	4·64
B (Women)	Secondary.....	9	18·1	12·34
	Junior	34	20·9	5·71
	Infant	33	20·8	6·47
	Whole	76	20·5	7·20
C (Men)	Whole	78	22·1	5·47
D (Women)	Whole	29	20·7	6·61
E (Mixed)	Men	32	16·0	7·41
	Women	11	16·1	9·84
	Whole	43	16·1	8·10

In order to discover whether there were any significant differences between the attitudes of students in the different colleges, an analysis of variance was carried out. The result showed that significant differences existed between the groups (see footnote*). To determine where these differences lay, the t-test was applied to the differences between the means of the groups taken in pairs.

* The value of the critical ratio obtained was significant at the 1 per cent. level.

This showed that there were no significant differences between the means of the Training College groups A, B, C, and D. The University group E, on the other hand, had a significantly lower (less favourable) mean attitude score than any of the other groups. This supports the earlier finding that the attitude of University Training Department students to teaching as a career is less favourable than the attitude of Training College students. In my previous research I found that among School Certificate candidates academic achievement was negatively correlated with attitude towards teaching as a career. It is probable that University students have been more successful academically than Training College students and that these two results are really evidence of one tendency. It is possible, too, that University students whose qualifications fit them for other work besides teaching, may on that account have a less favourable attitude than Training College students who have not that advantage.

The scores of the different sub-groups in Colleges A, B, and E were then examined. It was found that, in College A, the attitude scores of the Secondary students did not differ significantly from those of the Junior group, but that the attitude of the Infant students was significantly more favourable than that of either the Junior or Secondary students. In College B, no significant difference was found between the mean scores of the Secondary, Junior and Infant, students. In College E, the scores of the men and women students did not differ significantly.

VI.—Relation of attitude to teaching success.

Next, the attitude scores were correlated with the Final Teaching Marks awarded to the students at the end of their course. It was found that there was no significant connection between a favourable attitude and teaching success. At first sight this may seem a surprising result, but it is not really so. Thurstone and Chave[8] have defined attitude as the " sum total of the inclinations, feelings, preconceived notions, ideas, fears, threats, and convictions about any specific topic." An attitude, therefore, is essentially a compromise. The attitude test, " Teachers and Teaching " is concerned with many aspects of teaching as a career, with conditions of service, the social recognition of teachers, and the value of their work, as well as with the actual interest aroused by it. It is quite possible for a student to have a very moderate or even unfavourable view of the salary offered to and the social position of teachers, and yet to be deeply interested in the work and impressed with its value to the community. Such a student would not have a very high attitude score, but might well be a better teacher than one who expressed uncritical enthusiasm for all aspects of the career. This would account for the lack of correlation between attitudes and teaching efficiency.

VII.—Relation of intelligence to attitude and to teaching success.

Finally, the attitude test scores and the Final Teaching Marks were correlated with the scores in the intelligence tests. The correlations between the Final Teaching Marks and intelligence scores were all insignificant. This is in line with findings by other writers. Cattell,[9] after reviewing the results of intelligence tests in relation to teaching ability, draws the conclusion that " intelligence tests are of little value in predicting teaching ability *among college students who are already selected for intelligence* " (my italics). He adds that he has known no case of a successful teacher with an intelligence quotient of less than 100, but has measured several moderately successful teachers at or just above that figure. Pinsent,[10] dealing with University students, found no

significant correlation between teaching grades and intelligence. He suggests that, given a minimum of intelligence, " success in teaching is most strongly determined by qualities of personality." Pinsent is of the opinion that there is probably a limit beyond which qualities of personality " will not compensate for intellectual defects, but this limit is well down in the intellectual scale, at least for elementary and probably a good deal of secondary school work." It is, of course, possible that in an unselected sample of the general population there might be an appreciable correlation between intelligence and teaching ability, but no evidence is available on this point.

The correlations between the attitude scores and the intelligence scores are given in Table III.

TABLE III

CORRELATIONS BETWEEN ATTITUDE SCORES AND INTELLIGENCE TEST RESULTS.

College	Number	Correlation
A (Women) ..	80	−0·012
B (Women) ..	72	−0·25
C (Men)	71	−0·43
D (Women) ..	28	−0·44

Of these results, those for Colleges B, C, and D are significant and negative, i.e., the less intelligent students were more favourably disposed towards teaching than the more intelligent. These colleges are all situated in the same geographical area. College A is in a different area, and has an insignificant correlation between attitude scores and intelligence test scores. This is the one real difference found in the present study between the attitude test results in the various Training Colleges. It appears to mean that, in one area, the students who are least intelligent are the ones who are most favourably inclined towards teaching as a career. The evidence from another college in another area shows that this result cannot be generalised and made to apply to students in all Training Colleges. There is no evidence in this study which could explain this experimental result. Possibly an explanation might emerge from a social and economic study of the area from which most of the students in Colleges B, C, and D are drawn.

VIII.—SUMMARY.

1.—A test of attitude towards teaching as a career was given to students in four Training Colleges and a University Training Department.

2.—The attitudes of the students in the four Training Colleges were similar and were significantly more favourable than those of students in the University Training Department.

3.—In none of the groups considered was there any significant correlation between attitude scores and Final Teaching Marks or between intelligence test results and Final Teaching Marks.

4.—In three of the Training Colleges, the correlations between attitude scores and intelligence test results were significant and negative. These colleges were all in the same geographical area. In the fourth Training College, which is in a different area, this correlation was insignificant. It is suggested that the reason for the negative correlations might emerge from a study of the social and economic conditions in the area from which the three colleges draw most of their students

REFERENCES

[1] EVANS, K. M. : " A Study of Attitude Towards Teaching as a Career," *Brit. J. Educ. Psych.*, 1952, 22, 63-69.

[2] AUSTIN, F. M. : " An Analysis of the Motives of Adolescents for the Choice of the Teaching Profession," *Brit. J. Educ. Psych.*, 1931, 1, 87-103.

[3] VALENTINE, C. W. : " An Enquiry as to the Choice of the Teaching Profession by University Students," *Brit. J. Educ. Psych.*, 1934, 4, 237-259.

[4] TUDHOPE, W. B. : " Motives for the Choice of the Teaching Profession by Training College Students," *Brit. J. Educ. Psych.*, 1944, 14, 129-141.

[5] LADUKE, C. V. : " The Measurement of Teaching Ability, Study No. 3," *J. Exp. Educ.*, 1945, 14, 75-100.

[6] ROLFE, J. F. : " The Measurement of Teaching Ability, Study No. 2," *J. Exp. Educ.*, 1945, 14, 52-74.

[7] ROSTKER, L. E. : " The Measurement of Teaching Ability, Study No. 1," *J. Exp. Educ.*, 1945, 14, 6-51.

[8] THURSTONE, L. L., and CHAVE, E. J. : *The Measurement of Attitude* (Chicago : Chicago University Press, 1929).

[9] CATTELL, R. B. : " The Assessment of Teaching Ability," *Brit. J. Educ. Psych.*, 1931, 1, 48-72.

[10] PINSENT, A. : " Pre-College Teaching Experience and Other Factors in the Teaching Success of University Students," *Brit. J. Educ. Psych.*, 1933, 3, 109-126, and 201-221.

SUMMARIES OF RESEARCHES REPORTED IN DEGREE THESES[1]

The Value of the School Record Card in Predicting Ability to Succeed in Part-time Technical Education.

By D. H. WILCOCKSON

(*Abstract of thesis submitted in April, 1952, for the degree of M.Ed., at the University of Manchester.*)

INTRODUCTION.

Statistics prepared by the Council of the Union of Lancashire and Cheshire Institutes for the period 1947-1950, show that the number of students who succeeded in the preliminary technical examination conducted by the Union at the end of the first year's course of part-time study in an Evening Institute, was only a small proportion of the number of students originally enrolled ; the proportions were :

Year	1947-48	1948-49	1949-50
Number of students enrolled.....	5277	5140	6134
Per cent. who passed the examination..	39·1%	36·6%	36·9%

One of the factors contributing to this high student-wastage is the enrolment of students who do not possess the ability to attain the standard required by the examination, and who either fail to complete the course, or who are not entered in the examination at the end of the course, as they have no prospect of success. There is no selection of students at this early stage of their part-time technical education.

The aim of the investigation was to provide means which would enable Principals of Evening Institutes to advise intending, although unsuitable, students that they should enrol in a recreational course, or in an alternative technical course which would be more appropriate to their ability.

METHOD.

The investigation was limited to the students of five evening institutes who enrolled in the session 1950-51 and for whom school records were available. These were representative of the complete school population of Stockport. School record cards of these students were examined to determine whether or not some of the data recorded would give a measure of the student's ability to pass the preliminary technical course examination in the year following their last term at school.

These data were recorded in five groups :

(1) Details of personal history, e.g., home conditions, health, attendances.
(2) Results of intelligence tests and standardised attainment tests.
(3) Teachers' estimates of special abilities and personal qualities.
(4) Teachers' estimates of abilities in school work.
(5) The head teachers' summary of the educational standard reached on leaving school.

Teachers' estimates were in the form of a literal five-point scale, pupils being classified by teachers in the following proportions of the total school age-group :

A, 5 per cent. ; B, 20 per cent. ; C, 50 per cent. ; D, 20 per cent. ; E, 5 per cent.

[1]These Outlines must be submitted through the Head of the Department in which the research was carried out.

Examination of the data showed that the instructions for the completion of record cards had been followed by the teachers concerned, that the record card system was working satisfactorily and that the records were sufficiently reliable to justify further investigation.

Details of personal history were excluded as being outside the scope of the research and the statistical analysis was limited to ratings of intellectual capacity obtained from Raven's Progressive Matrices Test (1938) together with estimates of special abilities, personal qualities, abilities in school work, and the head teacher's summary of the education standard reached. The matrices test was applied in the absence of usable test results from the record cards.

DESIGN OF THE EXPERIMENT.

The preliminary experiment consisted in the selection of a limited number of variables from the eighteen variables recorded on the school record, to form a battery of predictors. The efficiency of this battery was determined by its correlation with the criterion of the examination result.

As a result of making a factorial analysis of teachers' estimates of both special abilities and personal qualities, a general factor appeared which contributed 79·4 per cent. of the total variance in estimates of special abilities, and 85·4 per cent. of the total variance in estimates of personal qualities. This factor was interpreted as ' halo ' effect. It was possible, therefore, to take one estimate from each group as representative of the whole group. Five other items on the record card were used as predictors, making seven in all, i.e., Arithmetic (Ar.) ; Science (Sc.) ; Crafts (Cr.) ; Head Teachers' Summary (H.T.S.) ; Intelligence Rating (Int.) ; Practical Ability (P.A.) (Special ability) ; Industry (Ind.) (personal quality).

Each predictor was correlated with the other six predictors, and with the criteria, i.e., examination scores in Mathematics, Science and Practical Drawing. Regression coefficients computed by Aitken's method of pivotal condensation were :

Correlation Matrices—7 Predictors, 3 Criteria—

	P.A.	Ar.	Sc.	Cr.	Ind.	H.T.S.	Int.	
P.A.	1·000	·483	·579	·546	·429	·545	·338	
Ar.		1·000	·649	·450	·419	·680	·397	
Sc.			1·000	·512	·442	·658	·359	
Cr.				1·000	·438	·544	·334	
Ind.					1·000	·605	·361	
H.T.S.						1·000	·454	Predictors
Int.							1·000	

	P.A.	Ar.	Sc.	Cr.	Ind.	H.T.S.	Int.	
Maths. Exam.	·344	·631	·548	·501	·444	·544	·627	Criteria
Regression Coeff.	−·187	·358	·180	·211	·103	−·082	·413	
Sc. Exam.	·225	·549	·444	·391	·312	·485	·496	
Regression Coeff.	−·244	·339	·116	·167	−·016	·088	·312	
Pr. D. Exam.	·414	·469	·488	·553	·545	·509	·549	
Regression Coeff.	−·018	·122	·029	·297	·218	−·062	·326	

Inspection of the regression coefficients which resulted from the preliminary experiment, led to the rejection of three of the less efficient predictors to give a battery consisting of :

Ar+Sc+Cr+Int.

The efficiency of this battery was tested in a second experiment by correlating the data in a set of fifty-four record cards, with success or failure in the examination as a whole as the criterion. Regression coefficients were :

Correlation Matrix—4 Predictors, 1 Criterion.

	Ar.	Sc.	Cr.	Int.
Ar.	1·000	·692	·503	·454
Sc.	·692	1·000	·570	·367
Cr.	·503	·570	1·000	·329
Int.	·454	·367	·329	1·000
Correlation (r_{bis}) with examination result	·711	·548	·363	·517

Regression Coefficients.

Ar.	Sc.	Cr.	Int.
·554	·107	−·056	·244

Multiple correlation with examination result :

$$r_m = ·748$$

It was apparent that assessments of crafts (woodwork) contributed little to this battery and that a battery consisting of Ar+Sc+Int. would be of greater practical value. The efficiency of differently weighted batteries of these three predictors is :

Weights given to each predictor.			Correlation with Exam. results.
Ar.	Sc.	Int.	r_{bis}
5	1	2	·759
2	1	1	·750
1	1	1	·732

It was decided, on the basis of this evidence, that the following battery would be most suitable for practical purposes as it gives the second highest r_{bis} and involves appreciably less computation than a battery using the first set of weights :

$$Ar \times 2 + Sc \times 1 + M \times 1.$$

A Practical Application of the Results.

Scores obtained from this battery (range 4 – 20) were named Tech. Scores. A scattergram of Tech. Scores versus examination result was obtained and it was found that, with two exceptions, all the successful students had Tech. Scores of 12 and over. The correlation between Tech. Scores and examination result, when the data of these two students were rejected, was found to be $r_{bis} = ·879$ (both students had failed the examination in the previous year).

Curve of the total number of misfits (admit/fails plus reject/successes) clearly showed that the total number of misfits is at the minimum at a Tech. Score of 12, and it was concluded that a Tech. Score of 12 might reasonably be applied as the level which will cut-off those students who have no prospect of success and yet admit nearly all those students who are going to pass the examination.

Conclusion.

The statistical evidence obtained in the research suggests that Principals of Evening Institutes in the area concerned, may reduce student-wastage in the first year of a part-time technical course by admitting only those students whose school record cards show them to have Tech. Scores of 12 and over. Students with Tech. Scores of 11 and under, should be recommended to take a recreational course or a technical course at a lower level.

A Study of the Rorschach Test Applied to a Group of Thirteen-Year-Old Children.

By W. T. BRANSTON

(*Summary of a thesis presented in part fulfilment of the requirements for the Ed.B. Degree at Glasgow University*, 1949.)

Rorschach considered that the parts of his test which were positively correlated with intelligence were the W (' whole '), M (' human movement '), F+ (' good form '), and O (' original ') responses ; the number of O's rising again in imbeciles but being of poor quality. The A per cent. (percentage of ' animal ' responses) and C per cent. (percentage of ' colour ' responses), he considered to be negatively correlated with intelligence. These relationships are shown in Table II.

Klopfer and Mons say that there are six factors which must be taken into account in assessing the intelligence level :

(1) Number and quality of W.
(2) Number and quality of M.
(3) Number and quality of O.
(4) F+ per cent.
(5) Variety of Content, including A per cent.
(6) Succession (whether rigid and orderly or loose and confused).

Mons claims to be able to assess the intelligence levels to within five points of a Terman-Merrill score, but he points out that this cannot always be done only on the basis of these six factors. Attention must also be paid to the presence or absence of ' neurotic ' symptoms, for which allowance must be made. There is no doubt that Mons uses his wide experience with the test and his general observations of the subject's reactions during the test to help him in this assessment. This means that there is doubt about the reliability of the Rorschach Test as an absolutely objective measure of intelligence. This will be considered in view of the results of the present study.

Forty-five children (20 boys and 25 girls) born in 1936, attending a junior secondary school in Paisley, were selected as the subjects of this experiment. They were given the National Intelligence Test, Scale A, Form 2, and the Otis Group Intelligence Test, Advanced Examination, Form A, and the results of these were combined with those of the Moray House Tests, Nos. 36 and 39, half the group doing each test in order to gain reliable measurements of their I.Q's., which are shown in Table I. The Moray House Tests had been given some time previously in the normal course of school examinations. After the Rorschach Test had been administered to them individually, they were given Stephenson's Perseveration Test as a group, and finally Whipple's Ink Blot Test of Imagination individually.

TABLE I

Average I.Q's. on Three Tests.

I.Q.	Frequency
115–124	4
105–114	13
95–104	12
85–94	9
75–84	7
	45

The Rorschach Test was applied according to the method given by Rorschach, and since the experimenter knew all the children there was no difficulty in obtaining a relaxed atmosphere before application of the test. An " inquiry " followed to

settle problems about location of responses and determinants. Table II from Klopfer and Kelley, following Beck and Rorschach, was used to obtain estimates of the rank orders for intelligence of the pupils according to the Rorschach Test.

TABLE II

INTELLIGENCE LEVELS ON THE RORSCHACH TEST (KLOPFER AND KELLEY).

	W	M	C	F+%	A%	O%
Very Superior ...	over 10	over 5	4–7	90–100	10–20	30–50
Superior	7–10	over 5	1·5–3·5	80–100	20–35	20–50
Average	4–7	2–4	0·5–2·5	70–80	30–80	0–20
Low Average ...	3–4	0–2	1·5–6·0	60–70	50–70	0–20
'Morons'	1–3	0	4–7	45–60	60–80	30–40
'Imbeciles'	0–2	0	5·5–8·5	0–45	80–100	40–70

A score of 1–6 was given for placings between Very Superior and 'Imbecile' in each of the columns of Table IV. Where a score in any column could lie in two positions, the mid-point between them was taken. For example, if a subject had 4 W's, the score given was 3.5, since this number of W's could be placed in either Average or Low Average positions, i.e., 3 or 4. The scores in each column were then totalled for each subject and a rank order obtained. The following were omitted from the rank order: 1 girl (only 9 responses); 1 girl (only four responses); 2 girls (no responses); 4 boys (Anatomy only); 1 girl (colour-naming and Anatomy only). Consequently, 36 subjects were ranked for intelligence according to the Rorschach Test.

The results of the three intelligence tests were inter-correlated: Rank Difference Correlation—Moray House and National ·792; Moray House and Otis ·837; National and Otis ·878. The mean of the scores of the tests, each scaled for I.Q., was taken for each of the subjects tested.

The rank difference correlation between the results given by the Rorschach Test and those of the intelligence tests was ·381, and that between F+ per cent. on the Rorschach and the intelligence tests was ·406.

The various Rorschach categories were then examined separately to discover any particular relations between intelligence and these categories, and the results are given in Table III.

TABLE III

Rorschach Category	Number of Subjects	Intelligence Test Average Ranking
More than 4 W	9	12·1/36
No W	6	24·7/36
More than 3 M	8	12·2/36
No M	13	21·2/36
More than 40 R ...	4	9·4/36
Less than 20 R	7	20·9/36
More than 80% F+	10	10·3/36
More than 30% O..	10	18·3/36
More than 70% A or Anatomy only	10	29·8/45
Anatomy only ...	4	36·2/45

From this table it is apparent that a large number of whole responses, of human movement, the total number of responses and a high percentage of good form

responses all indicate high intelligence; while absence of whole responses, absence of human movement, a small total and a high percentage of animal and anatomy responses indicate low intelligence. The percentage of original responses is not a good guide to intelligence. These findings accord reasonably well with Rorschach's own observations.

The subjects were given Stephenson's Perseveration Test. They wrote as many S's as they could for 30 seconds; then they wrote as many reversed S's as possible for 30 seconds: then normal S's were written again; lastly reversed S's were written for 30 seconds. After this for a period of two minutes, the subjects wrote S's alternatively normal and reversed. The total number of S's written during the second period of two minutes was subtracted from that made in the four combined periods of 30 seconds each, and the difference expressed as a percentage of the total number of S's written altogether. The measures obtained in this way were arranged in rank order for all the subjects. The rank difference correlation between the Rorschach intelligence results and these perseveration results was -·466, while the perseveration results gave a rank difference correlation of -·545 with those of the pooled intelligence tests. The individual results, when examined in detail, showed that the highest perseverators were not found at both extremes of the intelligence measures, but mainly at the lower ends.

Whipple's Ink Blot Test of Imagination was also used. The instructions were those provided by Whipple: "Each of these 20 cards has on it an odd-shaped ink-blot. When I say 'Now,' turn over the first card in this way (so that the numbered edge is towards the subject). Look at the ink-blot without turning the card in any other position and say 'Now' as soon as you have thought of something that the blot resembles. Of course, the blot is not really intended to be a picture of anything, but I want to see whether your imagination will suggest some picture in it, just as you sometimes try to see what object you can make out of a cloud." The score was the average time of the single associations.

The scoring of this test was difficult in the case of cards for which no interpretations were made. Some subjects rejected them in this way within a few seconds, while others continued to examine them until they were asked if they could not say anything. It was decided to set a time limit at a maximum of 60 seconds, and to take this as the response time except where the subject had rejected the card within that period, and then to accept the shorter time.

After the average response times had been calculated and ranked, the correlation with Rorschach intelligence results was found to be -·065.

It was observed that those who gave only Anatomy responses to the Rorschach Test gave many anatomy responses to Whipple's Blots. Interpretations such as water, sky and fire, which were determined mainly by colour and shading in the Rorschach, were missing from the Whipple responses. The Whipple responses, however, were examined from the stand-point of wholes, parts and the other Rorschach categories, and a table of results compiled. Although the number of whole responses increased in the Whipple test, the quality of these responses deteriorated. There was an increase in the number of human responses and a decrease in the number of animal responses in the Whipple series as compared with the Rorschach, and a tendency to good whole responses persisted. The first 9 in the F+ Rorschach percentage had an average of 6·1 good forms in the Whipple Test, while the last 9 had an average of 3·9 good forms. Of the ten subjects who had the widest variety of content in the Rorschach Test, 8 were included among the 12 who had the widest variety of responses to Whipple's blots, while only one of the 10 most stereotyped in the Rorschach appeared in this group of 12. There would seem, therefore, to be certain tendencies which remain stable in both tests.

REFERENCES

CATTELL, R. B.: "Temperament Tests II, Tests, *Brit. J. Psych.*, 24, 20-49 (1933).

DUBITSCHER, F.: "Die Persönlichkeitsentwicklung des Schulkindes im Rorschachischen Formendeuteversuch" ("Personality Development of School Children Reflected in their Rorschach Reactions"), *Z. Kinderforsch* (1933), 41, 485-494.

DUNMIRE, H. : " An Evaluation of Beck's Norms as Applied to Young Children," *Psych. Bull* (1939), 36, 629.

FORD, MARY : *The Application of the Rorschach Test to Young Children* (Inst. Child Welfare Monog., No. 23, (1946), Univ. Minnesota Press.)

HERTZ, M. R. : " Evaluation of the Rorschach Method in its Application to Normal Children and Adolescence," *Char. and Pers.* (1941), 10, 151-162.

KERR, M. : "The Rorschach Test Applied to Children," *Brit. J. Psych.* (1934), 25, 170-185.

KLOPFER, B., and DAVIDSON, H. H. : *Individual Record Blanks for the Rorschach Method of Personality Diagnosis.* (World Book Co., N.Y.)

KLOPFER, B., and KELLEY, D. M. : *The Rorschach Technique.* (World Book Co., N.Y., 1942 and 1946.)

LOOSLI-USTERI, M. : " Le Test de Rorschach, Appliqué à Differents Groupes D'Enfants de 10-13 ans" ("The Rorschach Test Applied to Groups of 10-13-year-old Children "), *Arch. Psych.* (1929), 22, 51-106.

LÖPFE, A. : "Uber Rorschische Formendeuteversuche mit 10-13 jährigen Knaben " (" The Rorschach Test Applied to Boys of 10-13 years of age "), *Z. Agnew. Psych.* (1925), 26, 202-253.

MAZA, A. LINARES : " Investigations con el Psicodiagnostico de Rorschach en Ninos, Normales Espanoles " (" Investigations on Normal Spanish Children with the Rorschach Test "), *Arch. Neurobiol.* (1932), 12, 693-738.

MONS, W. : *Principles and Practice of the Rorschach Personality Test.* (Faber and Faber, 1947).

RORSCHACH, H. : *Psychodiagnostics.* (Text and Plates, Hans Huber, Berne, second ed., 1942.)

VERNON, P. E. : " The Rorschach Ink-Blot Test," *Brit. J. Med. Psych.*, 1933, 13, 89-118, 179-200 and 271-291.

VERNON, P. E. : " The Significance of the Rorschach Test," *Brit. J. Med. Psych.* (1935), 15, 199-217.

WHIPPLE, G. M. : *Manual of Mental and Physical Tests* (1914).

BOOK REVIEWS

The Educability of Cerebrally Palsied Children: M. I. DUNSDON. (Nat. Found. for Ed. Res. and Newnes Ed. Pub. Co., Ltd., pp. x, 63, £1 1s. 0d.)

More than any other handicapped group, the cerebrally palsied demand a team approach based upon a genuinely joint responsibility of teacher, psychologist and pædiatrician. The task of caring for such children is difficult and costly. Hence at all stages from the initial attempt to estimate the child's capacities through to the stage of vocational guidance, the most careful assessment of his human potentialities and of his likely response to all types of education, physical, social, and intellectual, is imperative.

Miss Dunsdon's careful research rightly places the emphasis on 'educability.' Tacitly, this implies that, while medical care is essential at most stages, it is subservient to the task of developing as far as possible the total capacities of the individual. The author does not, however, neglect the physical aspects. She begins with a study based upon the available previous evidence and upon a special survey carried out by herself, of the incidence of cerebral palsy and its distribution by the main descriptive categories and by sex. In an appendix, she gives a balanced summary of the evidence concerning the main theories of aetiology, relating them as far as possible to the phenomena revealed by her careful psychological examination of more than 900 cases. Throughout the work, moreover, she is careful to indicate the intimate connection between physical handicap and psychological development, both in its direct causative aspects and in the more subtle indirect influences.

The bulk of the work, however, is devoted to the psychological and educational aspects of the problem—to the attempt to assess levels of intelligence, to the relation between intellectual growth and degree and type of handicap, to verbal ability and speech development, and to a close study of those anomalies of perception which may prove to be more important in determining educability than sheer intelligence itself.

The very carefulness of the work and its exhaustive nature draw attention to the difficulties of sampling in so small and so anomalous a group. A considerable section, for example, is devoted to the assessment of intelligence. The author draws attention to the problem of using with cerebrally palsied subjects the Terman-Merrill scale, which, standardised for normal children, has often to be, more or less arbitrarily, adapted to the handicaps of the particular case—with, of course, a consequent danger of loss of objectivity. In such a situation, everything depends upon the clinical insight of the psychologist, upon his intimate knowledge of the rationale of the test he is using, and upon his ability to interpret a performance against a sound back-ground of knowledge of normal child development. It depends too upon his having at his command a sufficiently flexible battery of supplementary tests, and on his being able to evaluate a wide range of evidence bearing not merely upon the immediate interview with the child, but the whole family picture and the child's previous history. Clearly, this is no task for the amateur; it is, notwithstanding, cheerfully undertaken by some 'duly authorised officers.'

The educational picture, as Miss Dunsdon is careful to point out, is still more obscure than the psychological one. The special schools for cerebrally palsied children in England have been functioning only for a few years and the total number of children accommodated in them is relatively small. In Chaper IX, however, Miss Dunsdon draws attention to the great irregularity in the distribution of abilities in these children which is such that, although a minimum I.Q. level of 85 is suggested for admission, the teacher of a class is faced with so wide a range and variety of handicap and capacity that education, in fact, must be individual. Though much experience has been gained by the teachers themselves as to method, and great ingenuity has been shewn in the adaptation of materials and apparatus, scientifically thorough-going experiment has not yet been possible. Only the continuous careful case study of a number of individuals over a period of years is likely to yield valid results on method.

This book is suggestive, not only for those concerned with cerebrally palsied children, but—and this applies particularly to Chapters III, IV and V—to those interested in the differential analysis of intellectual function. Miss Dunsdon does not speculate ; she observes, tests and records. But, in these three chapters, there is much to stimulate speculation in the minds of those psychologists who are concerned with cases of educational failure which cannot be traced either to specific weakness of general intelligence or to emotional disturbance in the child.

W.D.W.

Intelligence Testing : P. E. VERNON and others. (Times Publishing Co., 31 pp., 1s.)

This is a report out of two important articles by Professor Vernon which were published in *The Times Educational Supplement*, and of the letters and leaders to which they gave rise. The attention of readers was apparently concentrated too much on one aspect of Professor Vernon's articles, namely the report of a research by one of his students, as to the large increase in scores in group Intelligence Tests, as the result of special coaching ; whereas Professor Vernon himself points out that one or two hours' coaching is enough to produce almost the maximum possible effect. In at least one centre, such coaching of all the candidates in the junior school has been practised for a number of years.

One or two of the correspondents rightly emphasize the much greater evil of premature and constant special coaching in Arithmetic and English for the 11+ examination in the junior and even infants schools, as well as further cramming in some homes ; and it is to be hoped that those who have jumped to the conclusion that it " has been shown that intelligence tests are no good " (not too strong a phrase to describe some letters not published in this booklet) will note the last sentence of Vernon's final letter, which states that intelligence tests and objective attainment tests still provide the most reliable means of selection, without extra-ordinary precautions as to teachers' assessments, which are usually impracticable. Professor Vernon is good enough to say that " Professor Valentine's Quota scheme would be a real step forward." " But," he adds, " I find it difficult to envisage its applictaion in areas containing a number of very small primary schools."

The difficulty is felt, I imagine, because a number of such very small schools would have to be told that, as the result of the Intelligence Tests, not even one place in the grammar schools could be allocated to them. But would that be as bad as what happens now, namely, many small schools labouring hard and forcing on their pupils, for the 11+ examination to gain a grammar school place, and year after year failing to do so ? In such cases disappointed parents will usually attribute it to poor teaching in the school. Whereas, under the Quota scheme, the parents would be told that the local education authority had not awarded any grammar school place to the school, on the basis of intelligence tests, the results of which did not depend on the school teaching.

It is to be hoped that there will be a fuller report of Mr. Navathe's research, so that it can be compared in detail with other findings. In the meantime, any teachers or members of thc press, or irate parents, who imagine (and state in letters or leaders) that psychologists have, up till recently, been assuming that intelligence tests are infallible and unaffected by coaching, might turn up the fore-runner of this Journal, *The Forum of Education*, Vol. 3, 1924, where was published an article by a colleague in my University Department, Mr. H. E. Chapman, who claimed to show very large percentage improvements in tests through coaching. That was nearly thirty years ago !

C.W.V.

An Orally Presented Group Intelligence Test for Juniors : J. CORNWELL. (Methuen, 3s. 6d.)

Mr. Cornwell has devised an ingenious test for children aged from eight to twelve years. The test items (there are 100 of these, equally divided among five sub-tests) are read out to the children by the tester, examples being written on the

blackboard first. This method of giving the test avoids nearly all difficulties of reading and writing, for where a word is required in answer to an item, the multiple choice form is used, and all the child has to do is to write the first letter of the word that he chooses from the three or four words read aloud to him. A small handbook, easily carried in a pocket and containing instructions, norms and details of standardization is provided; and the only materials needed are ordinary exercise-book paper, pencils, a blackboard and chalk.

A few minor criticisms should, perhaps, be made. First, in the place of reading difficulties (which are minimised in the best tests) we may be up against difficulties in auditory perception. Second, the order of the correct items does not always seem to be random. Thirdly, to find the norms it is necessary first to reduce chronological ages to months, which is a nuisance and unnecessarily time consuming. Fourthly, in at least one sub-test an advantage seems to have been given to the cautious guesser.

This test should be useful to teachers who wish to grade children within a single class. But, if comparisons are made between results of children who have been tested by different persons, it should be remembered that the manner of giving the test is likely to vary greatly from one tester to another, a fact which might have considerable effect on the final scores, especially as there are no strict time limits imposed.

E.K.C.B.

Friedrich Froebel and English Education: Edited by EVELYN LAWRENCE. (Univ. of Lond. Press, pp. 248, 20s.)

This book was prepared to mark the centenary of Froebel's death. After an introduction by Miss Evelyn Lawrence, it provides the following useful chapters. The Origin of the Kindergarten and History of the Froebel Movement in England, both by P. Woodham-Smith. Froebel and the English Primary School of To-day, by J. P. Slight. The Influence of Froebel on the Independent Preparatory Schools of To-day, by O. B. Priestman. The Religious Roots of Froebel's Philosophy, by H. A. Hamilton. Froebel's Educational Philosophy in 1952, by N. Isaacs.

All are useful contributions, though not all agree in their estimation of the basic views of Froebel. In particular, Mr. Nathan Isaacs is critical of Froebel's view as to child nature. His rather prolix discussion of the psychology of early childhood, however, stresses unduly the necessity of conflicts in the little child's experience, and gives inadequate place to some of the innate impulses and activities of the child, which fit in better with some of Froebel's views, or at least with those of his more modern adherents.

The Causes and Treatment of Backwardness: SIR CYRIL BURT. (National Children's Home, pp. 144, 4s. 6d.)

This is the Annual Convocation Lecture of The National Children's Home, and it adds lustre to a series already notable. It is, of course, very much more than the lecture as delivered; and the author's name is enough to guarantee that it is an admirable exposition by the leading living authority on that subject.

While by no means a mere outline of the author's book, *The Backward Child*, it should provide an excellent introduction to that comprehensive and authoritative work. It deals with all the main types of factors concerned—environmental, physical, intellectual and emotional; and it concludes with a section on how best to deal with the various forms of backwardness.

The book is admirably printed by youths in The National Children's Home's own printing presses at Highbury Park, and it is sold at a price which must be little more than half what it would be if produced by an ordinary publisher. The 'Home' has done a great service to teachers and students of child education, as well as to its own workers, by arranging for this publication.

C.W.V.

Art and Everyman, Vol. 2: MARGARET H. BULLEY. (Batsford, large 4to, pp. 92 (text), with 838 illustrations, £2 5s. 0d. or 4 gns. with Vol. 1.)

This handsome book is the second volume of the pair which Margaret Bulley has written and prepared as " A basis for appreciation." That sub-title is a very good clue to the whole purpose of the books. The author has her own and very decided views as to good and bad art. Though she discusses modern æsthetics even in relation to the doctrines of Freud and Marx, her main desire is clearly that the reader, however unlearned he may be in the history of art, and however naïve in his judgments of artistic creations, should study first-hand these many samples that the books offer, that he should find out what *he* likes, while considering the comments and expositions that the author makes on these art products; she does not wish to coerce him, but to help his taste to develop.

Thus, Miss Bulley has not attempted a complete system of æsthetics, though she constantly stresses the importance of ' wholeness.' Her more theoretical discussions are often disjointed—with subsequent additions in a later part of the book. The value of her written text lies rather in the many illuminating or challenging comments on the wealth of art reproductions provided.

The first volume dealt chiefly with houses and their furniture, and with architecture. The second volume is largely devoted to painting and sculpture. There are over 800 illustrations, excellently reproduced, and of an amazing variety, from famous pictures by acknowledged masters of centuries gone by, to photographs of tennis stars in action, and to what some would regard as modern atrocities.

Though Miss Bulley does not attempt any serious discussion of the art education of the child or adult, she is herself constantly teaching and giving " demonstration lessons."

Like Volume I, this second part is beautifully produced, and again we must express our congratulations to the publisher for giving such great value by way of illustrations at such a reasonable price.

OTHER PUBLICATIONS RECEIVED

The mention of a book in this list does not preclude a later review.

Fatigue and Efficiency in Textile Industry: KALI PRASAD (University of Lucknow 1/8 rupees, pp. 76).

Rorschach's Test Volume III: S. J. BECK. (Grune and Stratton, $5·50, 39s. 6d., pp., vii+300.)

Phantasy in Childhood: A. DAVIDSON and J. FAY. (Routledge and Kegan Paul, 18s., pp. viii+188.)

A Nursery Play-Group. (Nursery School Association of Great Britain, 1s. 9d., pp. 12)

Learning and Teaching in the Infants' School: E. G. HUME. (Longman, Green, 10s. 6d., 267 pp.)

The Child's Conception of Number: JEAN PIAGET. (Routledge and Kegan Paul, 25s., pp. vi+248.)

Social Psychiatry: MAXWELL JONES. (Routledge and Kegan Paul, 18s., pp. xx+186)

Nursery Rhyme Reform—A Selected Bibliography: G. HANDLEY-TAYLOR. (True Aim pubs., 1s.)

Developments in Psycho-Analysis: Edited by ERNEST JONES. (Hogarth Press, 30s., pp. 368.)

Love is Not Enough: B. BETTELHEIM. (Geo. Allen and Unwin, 32s. 6d., pp. 386.)

Children Who Hate: F. REDLE and D. WINEMAN. (Allen and Unwin, 25s., pp. 253.)

Psychology of Adjustment: MIKESWELL and HANSON. (Macmillan, 34s., pp. 406.)

F. Froebel and English Education. (Univ. of London Press, 20s., pp. 240.)

Psychoanalytic Studies of the Personality: W. R. D. FAIRBAIRN. (Routledge and Kegan Paul, 25s., pp. 312.)

Psychiatry To-day: D. STAFFORD-CLARK. (Pelican Book, 2s. 6d., pp. 300.)

Social Psychology: THEODORE M. NEWCOMB. (Tavistock Pubs., 30s., pp. xii+690.)

The Sensory Order: F. A. HAYEK. (Routledge and Kegan Paul, 18s., pp. 208.)

London Express and *Workbook*: J. MILES. (Ginn and Co., 7s. 7d.)

World Health Organization Technical Report No. 48. (H.M.S.O., 2s., pp. 40.)

Chronicle of World Health Organization Special Number. (H.M.S.O., 2s., pp. 250.)

Research Review of the Institute of Education, Durham University: Edited by F. V. SMITH. (Univ. of London Press, 5s., pp. 52.)

God and the Unconscious: VICTOR WHITE. (The Harvill Press, 21s., pp. 277.)

Papers on Psychopathy: EDWARD GLOVER, HERMANN MANNHEIM, EMANUEL MILLER. (Institute for the Study and Treatment of Delinquency, and Bailliere, Tindall and Cox, 10s. 6d., pp. 191.)

A Theory of Psychological Scaling: CLYDE H. COOMBS. (University of Michigan Press, $1.75, pp. 94.)

VOLUME XXIII. JUNE, 1953 PART 2

THE PERMANENT CONTRIBUTION OF WILLIAM JAMES TO PSYCHOLOGY*

BY MARGARET KNIGHT
(*Lecturer in Psychology, University of Aberdeen.*)

I.—*Introduction.* II.—*James's contributions classified*: (*a*) *psychology and physiology*; (*b*) *experimental psychology*; (*c*) *extension of scope of psychology*; (*d*) *attack on atomism and associationism*; (*e*) *applied psychology*; (*f*) *psychology 'on the map.'* III.—*A concluding note on style.*

I.—INTRODUCTION.

PROFESSOR MACE, in a Foreword to a selection from James's writings, says: "James is the bridge in Psychology between the nineteenth and the twentieth centuries. He stands at the point of transition from a psychology which was, in fact, a branch of philosophy with some scientific trimmings to a genuinely scientific psychology with some philosophical entanglements. There is no comparable author whose roots run farther back and spread more widely, or whose branches stretch out further into the present."(1, p. 7.)

Few people to-day have ever looked into a pre-Jamesian text-book; so it may be well to begin an account of James's contribution to psychology by giving a sample of the type of introspective psychology that was being taught to students at the end of the last century. The following quotation is taken almost at random from *Psychology: Descriptive and Explanatory*, by G. T. Ladd (1892)†: "Every field of consciousness may be said to have a certain 'circuit,' inasmuch as it contains a larger or smaller number of discriminable factors or objects. It may also be said to have a certain 'intensity,' since we are much more alive psychically at some times than at others; and also a certain character or 'tone,' since the nature of the predominating form of mental life differs in different states of consciousness. For example, in illustration of the last distinction: sometimes the field of consciousness may be characterized as objective, for I am 'occupied with,' or 'absorbed in,' the perception of some natural object . . . At other times I am 'overwhelmed with' physical pain . . . or 'all alive with' expectation or joy. In other words, the field of consciousness is chiefly occupied with subjective feeling. Moreover, the different fields of consciousness, discriminable as such in the flow of mental life, succeed each other with varying degrees of rapidity." (p. 39.)

James reviewed Ladd's textbook in Volume I of the *Psychological Review*.‡ He wrote: "It seems to me little short of wonderful that a man should be able

* EDITOR'S NOTE.—This is the first article of a series which the Editor is arranging about some great psychologists of the past. The next article will be on G. F. Stout, by Professor Mace, and the next on William McDougall, by Sir Cyril Burt. We hope to include further articles on Thorndike and Spearman. It often seems that many of our younger psychologists have little idea of the amount which some present-day views in psychology owe to earlier writers, whose work they may know only through quotations by critics.

† Though it appeared some eighteen months after the *Principles*, Ladd's book is essentially pre-Jamesian in spirit.

‡ The review is reprinted in [2], pp. 342-5.

to make so many sub-divisions, and find so many distinct things to say on the descriptive level. But to be perfectly frank . . . I find this whole descriptive sort of treatment *tedious* as few things can be tedious, tedious not as really hard things, like physics and chemistry, are tedious, but tedious as the throwing of feathers hour after hour is tedious ; and I confess that when I think of the probable number of youths and maidens, hungry for spiritual food, who will now certainly be led over all these pages of fine print merely to get back all these terrific abstract words and sentences, I feel a sort of shudder at the violence done to human want. It is not that Ladd *qua* Ladd is a tedious writer . . . but that mere description as such, mere translation into words of what we already possess in living fulness in our bosoms, is bound to be tedious under any circumstances."

What James found " most strange " about descriptive psychology was its " lack of craving for insight into causes." Admittedly, as he said in another article,* psychology did not yet deserve the name of a science—" it is hardly more than what physics was before Galileo, what chemistry was before Lavoisier." But it was rapidly becoming a science, and its aim, like that of the other natural sciences, should be towards insight into causes, and towards " practical prediction and control." Psychology has made some progress towards this goal since these words were written, and it is to James more than to any other single person that the fact is due.

II.—James's contributions classified.

To state James's contributions to psychology in more detail, (*a*) he divorced psychology from metaphysics and united it more fruitfully with physiology and biology ; (*b*) he showed the importance of experimental psychology ; (*c*) he extended the scope of psychology and foreshadowed many later developments ; (*d*) he demolished certain theories, such as atomism and associationism, that were holding up progress ; (*e*) he showed the possibilities of applied psychology ; and (*f*) in general, he put psychology ' on the map.'

(*a*) *Psychology and Physiology.*

Though James himself was keenly interested in philosophical psychology, he never doubted that psychology ' belonged ' with the biological sciences. In 1875, in a letter to the President of Harvard, he said : " Psychology cannot be taught as a living science by anyone who has not a first-hand acquaintance with the facts of nervous physiology." Made in 1875, and, by an English-speaking psychologist, this statement was remarkable. Physiological psychology was flourishing in Germany, under such men as Wundt, Stumpf and Helmholtz, and it was being taught in Great Britain by Bain. But it was not taught in any American university ; the course James offered at Harvard in 1876 was the first of its kind. At that time, indeed, James was the only American psychologist qualified to give such a course. He had taken his degree in medicine, and though he never practised, his medical training proved an invaluable asset ; it gave him a professional flair and authority that no other American psychologist possessed, enabled him to meet the German physiological psychologists on their own ground, and commended his subject to biologists and others, who had previously regarded psychology as essentially an armchair activity.

James's main theoretical contribution to physiological psychology was his theory of emotion—known generally as the James-Lange theory, since it was

* First published in 1892 and reprinted in [3], pp. 316-27.

put forward almost simultaneously by James and by the Danish physiologist Lange. The theory, in its final form, may be summarized as follows. There are certain innate reactions of the nervous system to 'emotional' stimuli; these reactions produce changes, both in overt behaviour and in the viscero-vascular systems; some of these changes can be felt, and our feeling of them *is* the emotion.

The theory provides a good illustration of the difference in approach between James and his predecessors. Earlier psychologists had been content to fill pages with description and classification of the emotions ("mere translation into words of what we already possess in living fulness in our bosoms"), but James demanded insight into causes. His theory has now been refuted by the work of Sherrington, Cannon and others, who have shown (to put it crudely) that the seat of emotion is the hypothalamus, not the viscera. But though the James-Lange theory proved in fact to be wrong, it was the right *kind* of theory; and the research that disproved it (and in so doing added greatly to our knowledge of the physiology of emotion) might never have been undertaken but for the stimulus of a clear-cut hypothesis that could be tested by experiment.

(*b*) *Experimental Psychology.*

James was temperamentally unsuited to laboratory work, and disliked it heartily; experimental psychology, he said, could never have arisen in a country whose natives could be bored. Nevertheless, he successfully forced his nature for many years, and contributed to experimental psychology far more than is generally realised.

In 1876, three years before the foundation of Wundt's laboratory in Leipzig, James secured the use of two rooms at Harvard for housing psychological apparatus and conducting experiments. In so doing he founded, almost without realizing it, the first laboratory for experimental psychology in the world; and from then until 1883, when Hall's laboratory was opened at Johns Hopkins, Harvard was the only university in America which gave instruction in experimental psychology. In 1890, the Harvard laboratory was enlarged and reorganized, and James then withdrew from experimental work and handed over the laboratory to the able direction of Münsterberg.

But though his laboratory was a landmark in psychological history, James did his greatest service to experimental psychology by expounding it. In the *Principles* he brought together, and presented in digestible form, a mass of information on current experimental work—most of it deriving from Germany, and inaccessible before that time to non-German-speaking readers. James is often accused of an anti-experimental bias, but the fact remains that fully one-fifth of the *Principles* is devoted to description and discussion of experimental work—a far higher proportion than in any other general text-book of the time.

James seldom carried out experiments himself—he found them too boring; but of the few experiments he brought himself to perform, at least two were of historic importance. As most students know, James was the first psychologist to experiment on transfer of training. The plan of the experiments—carried out first with himself as subject, and later with some of his students—was to see whether daily practice in memorizing material of one type would lead to greater speed in memorizing material of a different type. The result was a more or less unqualified negative. Less generally known is the fact that James originated the 'rotation' test, which is still used in the diagnosis of deafness. His physiological knowledge led him to suspect that deafness of certain types

would involve a reduced liability to giddiness, and he carried out experiments which showed that this was the case.*

Experiments of this type, where there was a definite and not unimportant hypothesis to be tested, were in James's view well worth while. But he was impatient of experiments in which technique was more important than subject, and it was this type of experimentation that called forth his famous gibe about " prism, pendulum and chronograph philosophers." The great targets of his satire were Weber, Fechner and Wundt—more especially Fechner, who devoted years of his life to the measurement of discrimination-thresholds, in the hope of verifying a greatly over-simplified, pseudo-mathematical ' law ' about the relation between stimulus-intensity and sensation. Though he did not, like Hull, attempt to derive " basic laws of mammalian behaviour " from the study of rats, Fechner in his generation was in some respects the counterpart of Hull in our own.

Some of James's comments on Fechner are worth quoting. After paying tribute to Fechner's scientific integrity and personal charm, James continued : " But it would be terrible if even such a dear old man as this could saddle our Science forever with his patient whimsies, and, in a world so full of more nutritious objects of attention, compel all future students to plough through the difficulties, not only of his own works, but of the still drier ones written in his refutation. Those who desire this dreadful literature can find it ; it has a ' disciplinary value ' ; but I will not even enumerate it in a footnote. The only amusing part of it is that Fechner's critics should always feel bound, after smiting his theories hip and thigh and leaving not a stick of them standing, to wind up by saying that nevertheless to him belongs the imperishable glory, of first formulating them and thereby turning psychology into an exact science." ([3], Vol. I, p. 549.)

(*c*) *Extension of Scope of Psychology.*

Pre-Jamesian psychology had been mainly concerned with cognition, but James was interested in the emotions and motives of human beings, as well as in their perceptual and intellectual processes. Moreover, unlike some of the other pioneers in dynamic psychology, he did not study human beings in isolation and ignore the importance of social and cultural factors. Some modern pronouncements on this theme suggest that the authors have forgotten their James. Mr. Rattray Taylor, for example, in a recent important article on " Group Dynamics,"† refers to " a conclusion which may fairly be said to open a new epoch in psychological thought ; that behaviour is not simply a product of personality, *as has always been assumed* [our italics], but is the product of interaction between personality and the culture of a group." James certainly made no such assumption. In the chapter on The Self, for example, he wrote : " We are not only gregarious animals, liking to be in sight of our fellows, but we have an innate propensity to get ourselves noticed, and noticed favourably by our kind . . . A man's fame, good or bad, and his *honour* or dishonour . . . is his image in the eyes of his own ' set,' which exalts or condemns him as he conforms or not to certain requirements that may not be made of one in another walk of life. Thus a layman may abandon a city infected with cholera ; but a priest or a doctor would think such an act incompatible with his honour. A soldier's honour requires him to fight or to die under circumstances where another man can apologize or run away with no stain upon his social self . . . What may be

*The article describing these experiments appeared first in the *American Journal of Otology* (1882), and was reprinted in [2], pp. 220-243

†Penguin *Science News*, No. 16, 1950, pp. 93-106.

called ' club-opinion ' is one of the very strongest forces in life. The thief must not steal from other thieves ; the gambler must pay his gambling debts though he pay no other debts in the world. The code of honour of fashionable society has throughout history been full of permissions as well as of vetoes . . . You must not lie in general, but you may lie as much as you please if asked about your relations with a lady ; you must accept a challenge from an equal, but if challenged by an inferior you may laugh him to scorn." etc. (from [3], Vol. I, pp. 293-6 ; [4], pp. 179-81).

Modern social psychologists make essentially the same point, though they tend to make it with greater ' semantic formality,' to use Mowrer's tactful phrase. Thus Cantril urges that, in the study of individual behaviour, investigation of the standards of the *groups* to which a person belongs or aspires, should precede the study of individual personality-traits. " Every individual tries to place or anchor himself as an acceptable member in his social milieu or in some social setting, whatever the particular criteria for acceptance by his group or his aspired group may be . . . There is an unmistakable striving on the part of the individual to belong to his group or to some aspired group. Lack of social belongingness and conflicts in belongingness (marginality) are painful . . . We maintain, on the basis of accumulating evidence in several fields, that, in dealing with the identifications, ego-involvements and loyalties of individuals, the social psychologist . . . should start *first* by relating the individual to his reference and membership groups . . . Once a person is placed situationally in his group setting, then information concerning his personality characteristics will further help us account for the differential character of his reactions. These two approaches should not be regarded as a dichotomous antithesis, but as different aspects of the work to be done if the picture of man's ego-striving is to be complete."

In short : " Investigations of motivation, personality characteristics or other differential qualities will more adequately account for an individual's particular reactions in interpersonal relationships, and more accurately predict his ego-involvements in a given situation, if he is studied first in relation to his reference and membership groups."*

In depth-psychology, as well as in dynamic and social psychology, James opened up new ground. Thus he fully realized the importance of contemporary investigations into such subjects as hypnotism, dissociation and subconscious memory—investigations which were either ignored or treated as suspect by most academic psychologists of the day. There is still no better short account of hypnotism than that given in Chapter XXVII of the *Principles*. In the related field of parapsychology, James was yet further in advance of his time. The official attitude of the day was obscurantist—even T. H. Huxley took the conventional ' scientific ' line of refusing to examine the evidence. But James refused to regard any facts as untouchable. He was a member, and for two years the President, of the Society for Psychical Research, and, to the scandal of some of his colleagues, devoted considerable time to collecting and studying the evidence for telepathy, trance-phenomena, mediumistic possession *et hoc genus omne*—a task for which his combination of open-mindedness and critical faculty made him peculiarly well qualified. His general conclusions, after twenty-five years' contact with psychical research, may be indicated by a brief quotation from " Final Impressions of a Psychical Researcher " published the year before his death.

" ' Psychic ' phenomena are as massive and wide-spread as is anything in Nature, and the study of them is as tedious, repellent and undignified. To

* *The Psychology of Ego-Involvements*, pp. 5, 7, 8.

reject it for its unromantic character is like rejecting bacteriology because *penicillium glaucum* grows on horse-dung and *bacterium termo* lives in putrefaction. Scientific men have long ago ceased to think of the dignity of the materials they work in. When imposture has been checked off as far as possible, when chance coincidence has been allowed for, when opportunities for normal knowledge on the part of the subject have been noted, and skill in " fishing " and following clues unwittingly furnished by the voice or face of bystanders have been counted in, those who have the fullest acquaintance with the phenomena admit that in good mediums there is a residuum of knowledge displayed that can only be called supernormal : the medium taps some source of information not open to ordinary people." ([5], pp. 188-9.)

(*d*) *Attack on Atomism and Associationism.*

The official psychology of James's day was associationist. The basic dogmas of associationism were (i) consciousness is composed of elements—our perceptions are made up of atomic sensations and our thoughts of atomic ' ideas,' (ii) atomic sensations are impressed on the passive mind (or brain), and thereafter combined into percepts in accordance with the Laws of Association, (iii) the same stimulus must always produce the same sensation (the ' constancy hypothesis ').

James laid this theory in ruins. In the famous chapter on " The Stream of Consciousness " he attacked the view that consciousness is composed of discrete elements. It may be convenient for certain purposes to treat experience as consisting of separate ideas and sensations, just as it may be convenient for certain purposes to treat a river as a collection of drops, or a line as a series of points. But these divisions do not really exist in nature ; they are " mere arbitrary results of conceptual handling on our part."

Secondly, James denied that in sensation the mind, or brain, is a mere passive recording instrument. Rather (to quote Lyman) it is " an active experiencer which is not only continuously sensitive to the environment, but which goes out to meet it in an exploratory selective dynamic way."* All sense-experience is the result of selection—the selection being made in accordance with " our practical and instinctive interests and our aesthetic interests." James's remarks on this subject are full of anticipations of modern perception-theory, though the fact has been strangely ignored even by historians of psychology. Thus, Murphy writes : " Both French and German investigators began to notice about 1900 that individual differences in perception, recall and other cognitive processes were expressive of differences in temperament or attitude. The pioneer here was William Stern."† But in 1890 James was writing : " What is called our ' experience ' is almost entirely determined by our habits of attention. A thing may be present to a man a hundred times, but if he persistently fails to notice it, it cannot be said to enter into his experience . . . Let four men make a tour in Europe. One will bring home only picturesque impressions—costumes and colours, parks and views and works of architecture, pictures and statues. To another all this will be non-existent ; and distances and prices, populations and drainage-arrangements, door- and window-fastenings, and other useful statistics will take their place. A third will give a rich account of the theatres, restaurants, and public halls, and naught besides ; whilst a fourth will perhaps have been so wrapped in his own subjective broodings as to be able to tell little more than a few names of places through which he passed. Each has selected, out of the same mass of presented

* *In Commemoration of William James*, p. 201.
† *A Historical Introduction to Modern Psychology*, p. 423.

objects, those which suited his private interest and has made his experience thereby." ([1], pp. 99-100; [3], vol I, pp. 286-7; [4], pp. 172-3.)

James pointed out also that our needs and interests not only affect, but sometimes distort, our perceptions. Thus: "Anyone waiting in a dark place and expecting or fearing strongly a certain object, will interpret any abrupt sensation to mean that object's presence. The boy playing 'I spy,' the criminal skulking from his pursuers, the superstitious person hurrying through the woods or past the churchyard at midnight, the man lost in the woods, the girl who tremulously has made an evening appointment with her swain, all are subject to illusions of sight and sound which make their hearts beat till they are dispelled."

"I remember one night in Boston, whilst waiting for a 'Mount Auburn' car to bring me to Cambridge, reading most distinctly that name upon the signboard of a car on which (as I afterwards learned) 'North Avenue' was painted. The illusion was so vivid that I could hardly believe my eyes had deceived me." ([3], Vol. II, p. 96; [4], p. 322.)

Elsewhere, James anticipated some of the most recent developments in perception-theory. Thus the difference between 'structured' and 'unstructured' perception (to use the current terms) is vividly expounded in the following passage: "In this vague way . . with no sub-divisions *ab intra*, nor precise limitations *ab extra* . . . does every entirely new experience appear . . . A library, a museum, a machine-shop, are mere confused wholes to the uninstructed, but the machinist, the antiquary, and the bookworm perhaps hardly notice the whole at all, so eager are they to pounce upon the details. Familiarity has in them bred discrimination . . . A layman present at a shipwreck, a battle, or a fire is helpless. Discrimination has been so little awakened in him by experience that his consciousness leaves no single point of the complex situation accented and standing out for him to begin to act upon. But the sailor, the fireman and the general know directly at what corner to take up the business. They 'see into the situation'—that is, they analyze it—with their first glance. It is full of delicately differenced ingredients which their education has little by little brought to their consciousness, but of which the novice gains no clear idea." ([1], p. 143; [3], Vol. II, pp. 343-4; [4], pp. 362-3.)

It might even be claimed that an anticipation of McGinnies' "perceptual defence" is to be found in the remark that "when we have paid the faithless plumber for pretending to mend our drains, the intellect inhibits the nose from perceiving the same unaltered odour, until perhaps several days go by." ([3], Vol. II, p. 99, [4], p. 324.)

Finally, James dealt the death-blow to the constancy hypothesis by emphasizing that the effect of a sensory stimulus depends, not only on the personality, needs and interests of the person stimulated, but also on the context, spatial and temporal, in which the stimulation occurs. Thus, "when two objects act together on us, the sensation which either would give alone becomes a different sensation." ([3], Vol. II, p. 28.) "[A sense-impression] feels very different according to what has preceded it; one colour succeeding another is modified by the contrast . . . and a note, when the scale is sung up, sounds unlike itself when the scale is sung down; the presence of certain lines in a figure changes the apparent form of the other lines, and in music the whole aesthetic effect comes from the manner in which one set of sounds alters our feeling of another." ([3], Vol. I, pp. 234-5.)

Fifteen second-year psychology students were invited by the present writer to guess the authorship of these sentences. Thirteen ascribed them either to Koffka or Köhler.

(*e*) *Applied Psychology.*

James, like all other psychologists of the day, was led to the study of his subject mainly by intellectual curiosity. But, unlike most of his contemporaries, he was fully alive to the possible practical applications of psychology. Thus he wrote in 1892 : " We live surrounded by an enormous body of people who are most definitely interested in the control of states of mind, and incessantly craving for a sort of psychological science that will teach them how to *act*. What every educator, every jail-warden, every doctor, every clergyman, every asylum-superintendent asks of psychology is practical rules. Such men care little about the ultimate philosophic grounds of mental phenomena, but they do care immensely about improving the ideas, dispositions and conduct of the particular individuals in their charge." (², p. 319.)

James himself made important contributions to educational psychology. The *Principles* contains many passages of vital practical interest both to teachers and students ; for example, the section on the importance of organizing and ' structuring ' material that we want to remember :

" [If *n* stands for a past event, and N for the nerve-centres active in its recall, then it is obvious that the more paths there are in the brain leading to N], the prompter and surer on the whole the memory of *n* will be, the more frequently one will be reminded of it, the more avenues of approach to it one will possess. In mental terms, the more other facts a fact is associated with in the mind, the better possession of it our memory retains. Each of its associates becomes a hook to which it hangs, a means to fish it up by when sunk beneath the surface. Together, they form a network of attachments by which it is woven into the entire tissue of our thought. The ' secret of a good memory ' is thus the secret of forming diverse and multiple associations with every fact we care to retain. But this forming of associations with a fact, what is it but *thinking about* the fact as much as possible ? Briefly, then, of two men with the same outward experiences and the same amount of mere native tenacity, the one who *thinks* over his experiences most, and weaves them into systematic relations with each other, will be the one with the best memory. We see examples of this on every hand. Most men have a good memory for facts connected with their own pursuits. The college athlete who remains a dunce at his books will astonish you by his knowledge of men's ' records ' in various feats and games . . . The reason is that he is constantly going over these things in his mind, and comparing and making series of them. They form for him not so many odd facts, but a system—so they stick . . . In a system, every fact is connected with every other by some thought-relation. The consequence is that every fact is retained by the combined suggestive power of all the other facts in the system, and forgetfulness is well-nigh impossible.

" The reason why cramming is such a bad mode of study is now made clear. I mean by cramming that way of preparing for examinations by committing ' points ' to memory during a few hours or days of intense application immediately preceding the final ordeal, little or no work having been performed during the previous course of the term. Things learned thus in a few hours, on one occasion, for one purpose, cannot possibly have formed many associations with other things in the mind. Their brain-processes are led into by few paths, and are relatively little liable to be awakened again. Speedy oblivion is the almost inevitable fate of all that is committed to memory in this simple way. Whereas, on the contrary, the same materials taken in gradually, day after day, recurring in different contexts, considered in various relations, associated with other external incidents, and repeatedly reflected on, grow into such a system, form such connections with the rest of the mind's fabric, lie open to so many paths of

approach, that they remain permanent possessions. This is the *intellectual* reason why habits of continuous application should be enforced in educational establishments. Of course, there is no moral turpitude in cramming. Did it lead to the desired end of secure learning, it were infinitely the best method of study. But it does not ; and students themselves should understand the reason why." ([1], pp. 135-7 ; [3], Vol. I, pp. 661-3 ; [4], pp. 294-6.)

Again, *Talks to Teachers*, despite its unalluring title, is a brilliant book, full of practical and vivid discussion of educational problems which have lost none of their importance with the lapse of fifty years. For example : How far are rivalry and emulation permissible motives to appeal to in the classroom ? Is it possible or desirable to make every stage of learning interesting ? How can the teacher arouse interest ? Since no teacher of his generation solved the last problem so successfully as James, his remarks on the subject are worth quoting. The essence of his advice is that the teacher should always try to present new knowledge in such a way as to link it up with interests that already exist.

" This is the abstract statement ; and, abstractly, nothing can be easier to understand. It is in the fulfilment of the rule that the difficulty lies ; for the difference between an interesting and a tedious teacher consists in little more than the inventiveness by which the one is able to mediate these links and associations, and in the dullness in discovering such transitions which the other shows. One teacher's mind will fairly coruscate with points of connection between the new lesson and the circumstances of the children's other experience. Anecdotes and reminiscences will abound in her talk ; and the shuttle of interest will shoot backward and forward, weaving the new and the old together in a lively and entertaining way. Another teacher has no such inventive fertility, and his lesson will always be a dead and heavy thing." ([1], p. 237, [6], pp. 96-7.)

(*f*) *Psychology 'On the Map.'*

Finally, and more generally, James put psychology 'on the map'—mainly by writing a book about it that was so intellectually exciting, and so brilliant in style, that it appealed to a wide circle of educated readers, and not merely to professional psychologists. And James was not only a brilliant stylist ; he was a master of the art of exposition. An example may illustrate this point. A psychologist known to the writer relates how, on her first approach to the subject, she was bored and befogged by physiological psychology ; she was in the state (known to most students by sad experience) of struggling to assimilate a mass of un-co-ordinated, indigestible facts, with no structure, no closure, no feeling of getting anywhere. Then someone recommended James ; and, after considerable demur on the ground that he was out of date and unworthy of her attention, she read the chapter in the *Text book* on " The Functions of the Brain." This was a revelation. At last she had got a framework ; the field was structured ; or, to use James's more homely metaphors, she saw into the situation and knew at what corner to take up the business. From that day on, physiological psychology has been one of her dominant interests.

III.—A CONCLUDING NOTE ON STYLE.

It is sometimes said that current psychology has left the Jamesian tradition behind. It is one of the purposes of the present article to suggest that this view is exaggerated ; but it is certainly true as regards the Jamesian tradition of good writing. James, as we know, wrote slowly and painfully, "with blood and sweat, and groans and lamentations to heaven, and vows that I will never start to write anything again." The modern psychologist may reasonably claim that

he has no time for these struggles ; but, if he cannot write with distinction, could he not at least write with reasonable clarity ? One of the less admirable present-day trends in psychology is the growing tendency to express simple facts in pretentious pseudo-technical jargon, and never to use one word where ten will do. Psychologists who write, " studies carried out in the area of psychological rodentology " for " psychological experiments with rats," " diminution in vertical mobility " for " fewer opportunities for promotion," and " behavioural infertility " for " birth control " ; who translate " he goes into the garden " as " the behaving self is propelled to locomote in the direction of the garden," " she fell in love " as " a previously uncanalized sex-drive became oriented towards a unique goal-object," or " we can't do creative work unless we feel like it " as " the urge towards creative ideation must be primarily volitional "*— such psychologists are not raising the scientific status of their subject, as they may confusedly suppose, but merely implanting, in many judicious minds, the mistaken view that psychology is a bluff.

REFERENCES

[1] KNIGHT, M., with Foreword by MACE, C. A. (1950) : *William James.* (Pelican Books.)
[2] JAMES, W. (1920) : *Collected Essays and Reviews* (Longmans, Green and Co.).
[3] JAMES, W. (1890) : *Principles of Psychology,* Vols. I and II (Macmillan and Co.).
[4] JAMES, W. (1892) : *A Textbook of Psychology* (Macmillan and Co.).
[5] JAMES, W. (1911) : *Memories and Studies* (Longmans, Green and Co.).
[6] JAMES, W. (1899) : *Talks to Teachers on Psychology : and to Students on Some of Life's Ideals* (Longmans, Green and Co.).

* One of these examples is invented ; the rest are genuine.

YOUNG WORKERS AT A COUNTY COLLEGE

A Pioneer Investigation of the Needs, Interests, and Attitudes of 380 Young Workers Attending A County College

By E. M. EPPEL and M. EPPEL
(*Department of Extra-Mural Studies, University of London*).

PART II.

VI.—*Leisure interests.* VII.—*General attitudes and growth of independence.*
VIII.—*General conclusions.*

VI.—Leisure activities.

A knowledge of the voluntary leisure-time activities of young workers can be of assistance to those engaged in Further Education. It is not unexpected to find that the most popular subjects at the College may be related to the activities enjoyed most outside work. Attempts were made to cross-check, by asking, for example, how frequently they went to dances or to the cinema, and elsewhere by asking them to state what they enjoyed doing most in their leisure time, and by seeing how much they spent weekly on these activities. The main activities investigated were sport, cinema-going, dancing, reading, and club membership.

TABLE XVI

Activities Enjoyed Outside Work.

Boys		Girls	
Activity	*Frequency*	*Activity*	*Frequency*
Football	102	Dancing	68
Cycling	68	Cinema	41
Swimming	36	Swimming	40
Girl Friends	24	Cycling	39
Athletics	22	Tennis	34
Billiards	20	Walking	33
Tennis	14	Reading	31
Reading	14	Needlework	24
Camping or Hostelling	11	Ice Skating	22
Golf	10	Music	17
Gardening	10	Netball or Hockey	11
Cricket	6	Athletics	6
Clubs	6	Theatre	5
Boxing	6	Gardening	5
Speedway	5	Social, e.g., visits	5
Walking	5	Boy Friends	4
Ice Skating	4	Speedway	4
Handwork	3	Clubs	4
Music	3	Dramatics	3
Wrestling	2	Handwork	3
		Cooking	2
		Rowing	1
		Studying	1
		Radio	1
		Baby watching	1

The activities these young workers said they enjoyed are not necessarily those in which they *engaged* most frequently. The analysis of certain of these

activities which follows compares the figures for *enjoyment* (cf. Table XVI) with the figures for participation, resulting from such questions as " How often do you go to the pictures ? "

Radio.—It is striking that not a single boy, and only *one* girl mentioned *enjoying* the radio. It is possible that the radio has become so much part of the domestic background that listening to it is not regarded as a leisure activity worthy of comment.[1]

Cinema.—Not one boy mentioned enjoying the cinema as a leisure activity (cf. Table XVI). Yet the question on frequency of visits showed that only eight boys and four girls never went to the cinema, i.e., 3 per cent. of the total.[2, 3]

30 boys attended cinema three times a week.
21 boys attended cinema four or more times a week.

Girls went significantly less frequently than boys—only four went three times a week, and *none* more often.[4] Yet it was *girls* who said they enjoyed the cinema, high on the list of their leisure pursuits. It may be that the cinema has a greater emotional appeal for the girls.[5]

Dancing.—This was the most popular of all activities for the girls, but was *never* mentioned by boys (cf. Table XVI) although 108 went to dances, seven of them three or more times weekly. Far more girls went to dances than boys. There is a significant sex difference here ($P < 0{\cdot}01$).

Clubs.—A surprisingly high proportion of boys and girls gave the names of clubs to which they belonged. These included L.E.A., Church, Sports, and Industrial Youth Clubs. In all 140 boys and 70 girls said they belonged to some club. Very few, only 6 boys and 4 girls, mentioned " going to club " as something they enjoyed outside work. Of course, some of these clubs provided the other activities, e.g., cycling, athletics, dancing, which they said they enjoyed.

Theatre.—Was never mentioned as being enjoyed by the boys, and only five times by the girls.[6]

Reading.—The indications given by this part of the investigation, although faint, are encouraging.[7] Reading does at least receive some mention by both sexes, fairly high on the list of activities enjoyed outside work. The additional details that follow help to fill in the picture.

(1) *Membership of Libraries* (Public and/or 'Lending')—80 boys (c.1/3 of total) and 81 girls (more than half-total) were members of libraries. The sex difference is significant ($P < 0{\cdot}01$) and more girls mentioned that they enjoyed reading. (Cf. Table XVI.)

[1] Cf. STEWART, M. : " Leisure Activities of Grammar School Children," *Brit. J. Educ. Psych.*, Vol. XX, Pt. I, showed that 17 per cent. boys and 7 per cent. girls aged 15+ said they enjoyed listening to radio.

[2] B.B.C. Youth Inquiry (1951), found that 6 per cent. of the main sample, 1 per cent. of the Birmingham sample, and 13 per cent. of the Midlothian sample had not been to the cinema at all in the month preceding the inquiry.

[3] Cf. STEWART, M., *op. cit.*, found that 2·5 per cent. of her subjects did not go to the cinema.

[4] Cf. B.B.C. Youth Inquiry, *op. cit.*, where it was found that at all ages (11 to 24) boys attended more frequently than girls in the sample studied. The difference was, however, barely significant.

[5] Cf. WALL, W. D., and SIMSON, W. A.: " Responses of Adolescent Groups to Certain Films," *Brit. J. Educ. Psych.*, Vol. XX, Pt. 3.

[6] Cf. STEWART, M., *op. cit.*, 4 per cent. boys, 26 per cent. girls of grammar school children aged 15+ gave theatre as a favourite out-of-school activity.

[7] Cf. The statement in a B.B.C. Youth Inquiry, *op. cit.*, p. 20, " We can, therefore, assume that at the very least a good half of the younger generation do very little serious reading."

(2) *Books.*—84 boys (c.1 in 3) and 49 girls (c. 1 in 3) had not read a book or[1] could not remember the name of any book they had read in the past few months.

TABLE XVII

NUMBER OF BOOKS READ AND NAMED.

Age in Years	15		16		17+		Totals	
	Boys (62)	Girls (14)	Boys (108)	Girls (44)	Boys (60)	Girls (92)	Boys (230)	Girls (150)
Fiction	36	10	38	20	26	47	100	77
Non-Fiction	4	1	2	—	3	5	9	6

The difference between the total number for boys and that for girls is not significant. The names of the authors were seldom given with the titles of the books.[2] This may be indicative of the generally uncritical approach to reading.

Fiction heavily outnumbered Non-Fiction at all ages and for both sexes, and the quality of the works varied considerably within each age group. The girls' reading appeared to be of slightly higher quality than the boys' at all ages, more " classics " and genuinely adult works being mentioned in the detailed lists. The rather encouraging picture presented by those who *do* read, may however, be offset by the possibility that large quantities of *unremembered* ' pulp ' literature may have been consumed by those who could not answer the question.

There follows a selection of the titles given. Original spelling has been preserved. Each was mentioned once only except where frequency is indicated.

Boys—15 years—American Fantasy Book, Date with a Blond, Dangerous Mr. Dell, Snappy Bedtime Stories, The Phantom Herd, Crazy to Kill, The Mud-lark, Four Feathers, North West Passage, Leslie Charteris' Books, 50 Famous Trials, Tales of Mystery and Imagination ; 16 years—Spys at Work, Dow Among the Dea, Gunman Gallant's Ghost, Death on the Borough Council, Saddle Pals, Night of the Knuckles, Prestor John, Enter the Saint, Gone with the Wind, Robinson Crouse, Last of the Mohicans, N.W. Passage, King Solomon's Mine ; 17 years—Exploration of N. Guinea, Book on Queen Mary, 10 Days Wonder, John Buchan—Salute to Adventure, Midnight Sinner, No Tears for the Dead, This Woman is Death—by Hank Jansen, Tarzan and Lost Empire, Wed of Desire, Payment in Lead, Tom Brown's Schooldays.

Girls—15 years—Art of Walt Disney, Little Wiming, Floodtide, Gone with the Wind, Glad Surrender, Angry Man's Tale, Miricle, The Egg and I, Ultimatum, Good Wifes ; 16 years—Pride and Prejudice, Little Women 2, My Lady of the Chimney Corner, The Matchmaker, Private Inheritance, Rebecca, Gone with the Wind, The Reluctant Widow, Duel in the Sun, Eliza-beth—Captive Princess, Penny Plain, How Green was My Valley, Madame Bovary ; 17 years—Wooden Horse 2, The Big Fisherman, Gone with the Wind 2, Pickwick Papers, My Son My Son, Touched by a Loving Hand by D. S. Dempster, Postman's Knock, The Shadow on the Rock, Wuthering Heights 2, Jane Eyre 2, Frenchman's Creek, Shadow of the Past, The Foxes of Harrow, Subject—Murder (Witting), Condensed Plays of Shakespeare.

[1] Cf. The proportions in the Birmingham enquiry, *Eighty Thousand Adolescents* where 1 in 4 boys and 1 in 5 girls had read no book in the last 6 months.

[2] The wide range of titles given corresponds with the findings of the B.B.C.'s " A Youth Inquiry," *op. cit.*, p. 20.

TABLE XVIII

NEWSPAPER READING.

No. Mentioned	No. of times mentioned by	
	Boys (230)	Girls (150)
8 Dailies	114	76
3 Evening	73	33
7 Sunday and Weekly ..	70	25
TOTAL	257	134

All categories of local newspapers (Daily, Evening and Sunday) were more popular than their national counterparts. 22 boys and 20 girls did not read any newspaper, i.e., approximately 10 per cent. of the boys and 13 per cent. of the girls.[1, 2]

TABLE XIX

MAGAZINES READ.

Type of Magazine	No. of times mentioned by	
	(Boys 230)	Girls (150)
General (e.g. *Picture Post*)	51	19
Sports and Hobbies	18	1
Women's.....	—	76
Boys' Papers	81	—
Girls' Papers	—	12
TOTAL	150	108

Many more Boys' Papers were read by the boys than Girls' Papers by the girls. On the other hand there was a strikingly large consumption of Womens' Magazines by the girls—"Woman" and "Woman's Own" being the most popular.[3] It is not possible to compare this with any real counterpart among the boys since there are probably very few comparable magazines available for men, but even if the boys' figures for General Magazines, and Sports and Hobbies were added together, the result still falls short of the number of Women's Magazines read by the smaller group of girls. These facts, together with the high figures for Boys' Papers or[4] "bloods" (of which Wizard, Adventure

[1] Cf. WALL, W. D.: "Newspaper Reading of Adolescents and Adults," *Brit. J. Educ. Psych.*, Vol. XVIII, Pt. I, where it is shown that only very small proportions of the adolescent groups do not read a newspaper and that those non-readers are confined to the elementary and technical schools.

[2] STEWART, M., *op. cit.*, found 1·2 boys per cent. and no girls were non-readers among her 15+ age group of grammar school children.

[3] WILLIAMS, A. R.: "Magazine Reading of Secondary School Children," *Brit. J. Educ. Psych.*, Vol. XXI, Pt. 3 shows that a much smaller proportion of girls in the 15+ age group of secondary modern and grammar schools, viz, 16 per cent. and 21 per cent., read women's magazines, than in this sample of young female workers. This may be an indication of the greater emotional maturity of the latter.

[4] Cf. WILLIAMS, A. R., *op. cit.*, high proportion of secondary modern and grammar school boys aged 15 (43 per cent. and 40 per cent.) who read 'bloods.'

and Hotspur were favourites, containing mainly adventure and school stories), may be a further indication of the greater maturity of the girls, as reflected in their interests.

Budgets of Personal Spending Money.—This part of the questionnaire was designed to give some indication of the amount of pocket money these young workers had to spend, excluding money paid to their families, or used for food and other necessities. 198 boys and 118 girls gave budgets for a week. Some were not quite sure *what* they had weekly, since the amount might vary with tips or overtime; others were unsure because they often had extras from parents, or because they borrowed in anticipation of overtime, etc.

However, those budgets that were given, indicate a weekly average of:

11·55/– personal pocket money for boys.

11·88/– personal pocket money for girls.[1]

The sums saved out of personal pocket money were also obtained; these averaged 3·4/– for the boys, and 3·3/– for the girls (cf. table below).

TABLE XX

Amount	Weekly Pocket Money		Weekly Savings	
	Boys (230)	Girls (150)	Boys (230)	Girls (150)
0/– — 4/–	13	8	69	57
5/– — 9/–	76	44	11	13
10/– — 14/–	64	40	—	—
15/– — 19/–	26	15	2	2
20/– — 24/–	6	2	—	—
25/– — 29/–	7	2	—	—
30/– — 34/–	5	3	1	—
34/– — 39/–	1	4	—	—
	198	118	83	72

It is not possible to compare items as between boys and girls since the latter sometimes stated "boy friend pays," e.g., for dancing or cinema. A few points of interest stand out from the detailed budgets.

How the money is Spent.

Books, Newspapers, Magazines.—135 out of 198 boys giving budgets spent *something* on this item, varying from 2d. to 5/– weekly, most frequently about 1/– weekly. About half the girls giving budgets, 67 out of 118, did likewise.

Cinema and Dancing.—Mentioned in most budgets, cost between 1/3 and 10/– weekly.

Smoking.—Mentioned by 82 boys and 21 girls, cost from 1/– to 17/6 weekly. Some examples are: 3/6, 5/–, 7/6, 10/– at 15 years of age; 3/6, 5/–, 7/6, 10/–, 14/–, 17/6 at 17 years 7/6, 10/–, 14/– at 16 years of age; 3/6, 5/–, 7/6, 10/–, 14/– at 17 years of age.

Gambling.—Was mentioned, unsolicited, by 17 boys, mostly in the 17 year age group, and averaging about 5/– weekly.

Cosmetics.—A relatively small number mentioned this, i.e., 54 girls in all, spending between 3d. and 5/– weekly. Some of the older girls mentioned

[1] REED, B. H., *op. cit.*, Table XX shows similar averages.

clothes (one a pound weekly), birthday presents, gramophone records, contributions to the telephone bill. Only two girls and no boys mentioned money for charities, both connected with religious organizations.

Further investigations of this topic would seem to be of importance. The information can be used for a variety of teaching purposes, and particularly for training young people in the handling of their own finances, an important preparation for adult responsibility and family life.

VII.—General Attitudes and Growth of Independence.

The foregoing discussion on these 380 young people has, in a certain sense, been artificially divided to consider their interests in, and attitudes to, Work, Further Education and Leisure Pursuits. There is, however, one striking characteristic of all their attitudes—that of a growing independence. If the county colleges are to be concerned with the total personalities of the young worker-students, then an important aim must be to foster this independence and assist them to build up friendly co-operation with adults, rather than to increase any of their latent feelings of resentment.

(*a*) *Discipline and Independence.*—Although the problem of discipline in further education was not investigated specifically, some of the comments throw light on a deeply felt desire on the part of many of these students to be treated as adults.[1] Even when the remarks seem extravagant or exaggerated they are undoubtedly symptomatic of a need to achieve prestige in their own and other's eyes. "They say they treat all the boys at this college like young men, yet they refuse to let you smoke in class" (boy—16 years). "When you start work you get a feeling of responsibility . . . I think they could come and go a bit with the pupils as we are working the same as them" (boy 17—years).

Suggestions for greater student responsibility in running clubs, and other extra-curricular activities, are based on a sound psychological principle, the need for increasing independence of adult authority.

(*b*) *Privacy.*—The possibility of obtaining privacy has long been agreed as an important need of adolescents. Present-day housing conditions make the problem very complicated. Nevertheless, it is useful to have some idea of the facts. The figures show that less than half of the young workers in this group possessed a room of their own at home (46 per cent. of the boys, 46 per cent. of the girls). This is evidence of the valuable part that county colleges can play in helping to make up for some of the deficiencies of home environments.

(*c*) *Age of Independence.*—An attempt was made to see with what features of life they associated independence of adulthood. They were asked, for instance, at what age young people should (1) go on holiday away from the family; (2) keep their own wages; (3) get married.

The trends observed show that both boys and girls expected to be sufficiently independent to go on holiday away from the family at an earlier age than that at which they expected economic independence. It appeared that the girls were less adventurous about leaving the shelter of the family for holidays, although they expected to marry slightly earlier than did the boys.[2] The average pattern of developing independence for both boys and girls was holidays away from family, followed by economic independence, followed by marriage.

(*d*) *Aspirations and wishes.*—A short essay, "What I would do with a present of £50," was set to investigate the students' wishes and aspirations.

[1] Wall, W. D., *Brit. J. Educ. Psych.*, Vol. XIV, Pt. 1: "Every effort is made to treat even the least mature as fully responsible adults and to avoid the atmosphere of a return to school."

[2] Average age for marriage given by the girls was 21·7 years, by the boys 23·1 years.

TABLE XXI

"WHAT I WOULD DO WITH A PRESENT OF £50."

BOYS (230)	*Times mentioned*
Share with Family (part or whole)	102
Bank (part or whole)	87
Clothes	78
Bicycles	64
Holidays	30
Motor Cycles	25
Equipment, e.g., hobbies, sport	22
Work, Tools, etc.	13
Entertainment	10
Books	3
Furniture	3
Motor Car	1
Caravan	1
Canoe	1
Pets	1

GIRLS (150))	*Times mentioned*
Share with Family (part or whole)	121
Clothes	61
Holidays	57
Bank (part or whole)	48
Share with Friends	13
Equipment, e.g., hobbies, sport	4
Bicycles	3
Jewellery	3
Furniture	3
Books	3
Cosmetics	2
[illegible]	1

Feelings of individual deprivation are probably reflected in the high rank of clothes for both boys and girls. Considerable detail was sometimes given of the exact kind and numbers of garments they would buy, "draped suits," and "crepe shoes" occurring very frequently for boys. Their holiday wishes were similarly detailed, and ranged from the continent and the colonies, to a trip to the International Soccer Match at Wembley.

On the whole there were indications of seriousness of mind and responsible attitudes. The stress was on necessities rather than on luxuries. The high ranking of savings (Bank) especially with the boys, probably reflects family struggles for economic security.

The outstanding feature is undoubtedly the very strong sense of responsibility felt towards their families, indicated by the top ranking item for both sexes.

Comparative data were obtained by setting the same essay to random samples of 15 to 17 year old boys and girls attending a large grammar school with moderate fees. The school is situated in a central area of the same city, and the essay was set in the same month. There were 40 boys and 42 girls in these samples. Ranked tables based on frequency of response (grammar school groups) follow:

"WHAT I WOULD DO WITH A PRESENT OF £50."

BOYS	*Times mentioned*
Bank (part or whole)	26
Equip. for Sports or Hobbies	12
Holidays	11
Share with Family (part or whole)	8
Bicycles	7
Cars (secondhand)	4
Books	3
Share with Friends	2
Entertainment	2
Records and Music	2
Clothes	2
Charity	2
Motor Cycles	2
Radio	1
Pets	1
Stocks and Shares	1

GIRLS	*Times mentioned*
Holidays	21
Bank (part or whole)	15
Share with Family (part or whole)	14
Clothes	8
Equip. for Sports or Hobbies	8
Charity	4
Bicycles	4
Share with Friends	4
Cameras	3
Records and Music	2
Watches	2
Future careers	2
Books	2
Cosmetics	1
Electric Blanket	1
Radiogram	1

Certain *similarities* emerge between the grammar school and further education groups. Economic security assumed great importance, especially among the boys. Holidays were ranked higher by both groups of girls—appearing at the top of the list for the grammar school girls.

One great *difference* between the groups was in the position of *clothes*, ranked high for both sexes of the main sample, comparatively low by the grammar school girls, and very low by the grammar school boys. This may reflect real differences in social and economic background, the young workers probably being responsible for purchasing their own clothes.

The outstanding *difference* between the two main groups is unquestionably in this sense of responsiblity towards the welfare of their families. This item clearly ranked as top with both sexes of the further education group, but was only third with the grammar school girls and fourth with the grammar school boys, well behind Equipment for Sports and Hobbies. Even allowing for the smaller numbers in the school groups, the tendency towards a greater concentration on *personal* needs seems quite definite there.

This should certainly induce an attitude of caution towards the widespread facile generalisation that modern young working people are irresponsible and selfish . . . The following quotations speak for themselves :

" I would put it in the bank and think it over. I would ask my mother if there was anything she would like for the house, or for herself. Then I think I would buy a new bike with all the fittings. And if I had any left I would leave it in the bank along with the rest of my savings " (boy—15 years). " I would give £40 to my Mother and Father so as they could have a right good holiday, the other £10 I would spend on myself and brothers and sisters " (boy—16 years). " If I had £50 I would first put about £30 in the bank, with the other £20 well I would order a ticket for the theatre, come out of theatre I would go in to a Restaurant and get a taxi home to my house " (boy—17 years). " I would give it to my parents, and hope that they would give me a few pounds to go out and enjoy myself " (boy—16 years). " I would place it in the bank until such times as my family or relations would need some help financially, for instance if any relation sick and the family were running short of money " (boy—15 years). " If I had £50 I would try and buy a small business for instance a horse and cart. Doing this I would start to sell fish or fruit and if this was successful I would buy other horses and carts and stretch my little business still further and I think this would be a pretty wise way to spend fifty pounds " (boy—16 years). " I think the first thing would be to see nothing was really needed by my parents and people at home. Then I would get myself clothes I would definitely buy a bicycle and then I would buy books to help me with my trade and I would also buy tools to help me when I learned my trade " (boy—16 years). " First of all I would buy a new rig out, then I would clear the rent for that month for my mother and what ever was left over would be hers " (boy—16 years). " If I had £50 I would make a down-payment on a washing machine. Not because I dont want anything for myself but because I know I'll probably never have £50 again and I think when my mother has raised a family and come to her time of age she needs some luxuries " (girl—17 years). " I would buy some decent clothes because the ones I have just now are aged, and if there was anything left I think I would have a holiday of some sort. I think I would also like to have my hair permed a really good one " (girl—16 years). " Bank it for a long time. 50 years or so " (girl—16 years). " Give the £50 to Father and Mother, get them a good holiday and enjoy themselves. I would stay home and make tablet with everyone's sugar ration " (girl—17 years).

These short essays vividly reveal not only the extent of the feelings of personal deprivation, but also the strong sense of responsibility towards the family as a unit, and the depth of family ties.

It is perhaps appropriate to end with the words of a 16 year old salesgirl in a well-known multiple store :

"Well all I can say is if I ever had £50 I really wouldn't know what to do with it first as there are really so many things that need done and they are all as important as each other. I would like to give my mother a holiday, as she works every day in her life and shouldn't really as she has T.B. The house is needing a lot of repair regarding furniture, linen, etc., etc. I would like to study music every day. My father has just finished a course in watchmaking and can't get a job. I think it would be much wiser if I gave him the money to keep house and get us food, for after all these are the things you need to live."

SUMMARY OF CONCLUSIONS.

1.—*Classification of Students.*—The wide individual variations in intelligence and in educational achievement among the young workers investigated require consideration. Apart from the need for early grading on a scientific basis so that work for each student may proceed at an optimum pace, there is also the problem of the county colleges' responsibility towards those seriously retarded in the basic subjects. The county colleges may have to be brought within the orbit of the School Psychological Service, or special provision of trained personnel may have to be made to ascertain whether low intelligence, loss of schooling, or emotional factors are involved.

2.—*Incentives in Further Education.*—The investigation has indicated the importance of harnessing the spontaneous enthusiasm engendered by personal interests to the service of Further Education. Strongly marked patterns of interests were found in the spheres of jobs, leisure, and personal relationships. Those engaged in the work of Further Education might, therefore, take into account:

Vocational interests, as a starting point for understanding the nature of contemporary society, for enriching their personalities, and for giving them a genuine pride in progressive mastery of their chosen techniques.

Leisure interests, to help them to a realisation of the importance of constructive leisure activities in the development of a personality. It may be possible to induce critical discrimination in their choice of films and books.

Strong Family Ties, revealed by this investigation, as a basis for teaching social studies, and as a preparation for citizenship.

3.—*Methods.*—(*a*) *Activity.* There may be a danger that Further Education may become too passive or limited to *discussion* of theories and opinions. Some form of projects, student conferences, and job forums are likely to be valuable. The whole question of 'subjects' may have to be reconsidered.

An important task of Further Education is to help create and foster *new* interests. Many 'options' may need to be provided so that the students can have a real chance of developing latent interests.

(*b*) *Goals of Achievement.* The evidence shows the need for young workers to gain a sense that they are making progress. Methods may have to be devised to bring this about without recourse to examinations. The importance of *targets* is especially great in the theoretical subjects.

4.—*Morale.*—There is a need for students to assume active roles in the affairs of county colleges, with representation in matters concerning them. The recognition and fostering of their developing independence and growing desire for adult status is a most important factor in the maintenance of morale.

5.—*Social Relationships.*—The importance of satisfactory social relationships is repeatedly borne out by this inquiry. Girls especially found the ' social occasions ' of great value. Opportunities to run a refreshment bar, or to entertain staff, can provide an important part of ' social education.' Sports, e.g., football matches, can help in the same way. Incidentally, this need for social intercourse, is one where satisfaction is often lacking in the students' own home environment.

6.—*Vocational Guidance.*—The figures indicating dissatisfaction with present jobs merely serve to emphasise the general need for some form of Vocational Guidance for adolescents. The problem is a most difficult one for county colleges in their present stage of development, especially as it involves the employers who allow their young workers to attend. If the colleges fulfil their rôle of creating new interests the problem may even be intensified. Perhaps in the course of time comprehensive L.E.A. Vocational Guidance schemes will be brought into action which will continue to operate through the county colleges, and serve the young worker after he has finished with formal schooling. In the long run such a state of affairs would be to the advantage of employers as well as of workers.[1]

7.—*General.*—Severe practical difficulties, economic and material, inevitably restrict the planning of further education. Only by constant testing of the consumers reactions and also of the producers' methods and techniques can we hope to see real progress made. We need to draw on the resources of Adult Education as well as on those of school teaching. To be of value, further education for young workers must, like all other Adult Education, be based on voluntary co-operation. The people engaged in educating the young worker must have prestige in his eyes, and must understand the needs and interests of young workers, not merely of young people. The adolescent at work resembles in some ways the adolescent at school, but in others he is quite different and, more important, he feels himself to be quite different.

[1] Colleges might at least perform the function of reminding young workers of such vocational guidance facilities as are available to them through the Youth Employment Service until they reach eighteen years of age. The need for such reminders is stressed by HIGINBOTHAM, M. : *The Youth Employment Service* (Methuen, 1951, pp. 205-206).

THE VOCATIONAL PREFERENCES OF SECONDARY MODERN SCHOOLCHILDREN*

By MARY D. WILSON
(Senior Educational Psychologist for Ealing, Middlesex).

Part I—Appropriateness of Vocational Choice.

I.—*The problem.* II.—*Method of investigation.* III.—*Results of investigation*: (*a*) *occupations chosen*; (*b*) *choice related to industrial needs of the district*; (*c*) *vocational choice related to general intelligence*; (*d*) *vocational preferences revealed by paired comparisons.* IV.—*Discussion.*

I.—The problem.

The need for vocational guidance is now officially recognised. Few would doubt that the child leaving school needs expert help to achieve the self-knowledge and vocational information which will enable him to choose from an immensely complex industrial field one occupation to suit his abilities and satisfy his interests. This work of vocational guidance is at present being carried out by psychologists, youth employment officers and teachers, all of whom must, sooner or later, wonder how seriously to consider the expressed preferences of the children themselves. It is certain that some children make wildly unsuitable choices; it is equally certain that others have achieved success by obstinately following their own inclinations; to generalise from either extreme would be as unwise as it is tempting. Some general relationship between interest and ability has been demonstrated by many workers from Thorndike onwards; but whether such a relationship exists in young persons contemplating their future occupations, can only be decided by studying the vocational interests of large numbers of unselected children in relation to the abilities and opportunities of those children. Some valuable earlier studies have been restricted to small or highly selected groups such as young people voluntarily seeking vocational guidance,[11] or others whose education has been prolonged beyond the official school-leaving age.[8, 15] It was for this reason that the children chosen to take part in the investigation about to be described represented the rank and file of the child population as found in the secondary modern schools. The investigation had two main purposes: (1) to discover how far the vocational aims of children near to school-leaving age were in accordance with their abilities and vocational opportunities, and (2) to study some of the factors making for realistic vocational choice.

Similar studies carried out in America, mainly during the two decades between the wars, had shown children to be alarmingly unrealistic; it was quite common to find as many as 50 per cent. wishing to enter professional occupations which were actually available to not more than 5 per cent. What Kitson[10] called the "lure of the white-collar job" has been described as a serious reflection on the orientation of American high school education[12] and occasionally as an indictment of the competitive nature of the whole American society.[5] Some of the investigations on which such statements were based have been criticised by Trow[18] on the grounds that the form of question asked would be

* This work is more fully reported in the author's Ph.D. thesis, *Realism in Vocational Choice* (London, 1951).

liable to stimulate the phantasies of the children; but the very extensive survey conducted by Menger,[12] which produced substantial evidence of high vocational ambitions, survives this criticism. It is, nevertheless, interesting to note that since 1941, the year of Trow's article, American investigations have shown a gradual decline in the popularity of white collar occupations, and in a recent study by Moser[13] the pupils of one high school were shown to be able to make appropriate choice of vocation.

In Britain the problem has been less widely studied, and there has been no conclusive evidence of a general tendency towards immoderate ambition. In 1927 Valentine and Ritchie[19] found that many grammar school pupils chose occupations for inadequate reasons; and some years later Pallister[14] showed that, in the Dundee area, the wishes of the children were not such as to satisfy the industrial needs of the district. Some previous investigators have studied appropriateness of choice by relating the ambitions of the children to their general intelligence; Hawkins[7] carried out his enquiry in a central school, Hecker[8] in a co-educational grammar school, and Stephen[15] in four girls' grammar schools. All three found some measure of over ambition, but the two workers in grammar schools found a tendency for the less intelligent pupils to have more modest aims. In the enquiry conducted by Hawkins no such tendency emerged, possibly owing to the homogeneity of a central school population. Like their American counterparts, the children in this country have tended to choose disproportionately from a few well-known occupations, but they have not, on the whole, shown any unreasonable preference for professions or contempt for manual work. The work of Freeston[6] and Jahoda,[9] with fairly representative samples of children, suggests some measure of over-ambition, but not such as to cause serious frustation. Children of average ability wishing to become doctors or lawyers must be disappointed; but where such children choose skilled manual work to which they cannot attain, they may be able to do semi-skilled manual work very similar in nature and purpose.

In both Britain and America, the use of intelligence tests in relation to vocational choice has generally established a tendency for more intelligent children to choose higher ranking occupations. Moreover, the proportions of children making correct choice according to level of intelligence have been remarkably similar; it has most often been found in both countries that 50 per cent. would choose incorrectly, the incorrect choices being more frequently on the ambitious side. Such investigations have, however, been too few in number and limited in scope to dispel the impression that, throughout most of the present century, American children have been less realistic than British children. American commentators have laid the blame on the high schools, and it may well be that differences in our educational system account for the fact that there is less need in this country for special efforts " to give the manual occupations their rightful place in the social scheme."[12] In Britain, it has not been the general custom for children whose intelligence is only average or below to be educated in schools orientated towards preparation for the professions.

II.—Method of investigation.

While it is comparatively easy to ask large numbers of children what future occupations they have in mind, it is more difficult to establish criteria by which to judge the suitability of these choices. Satisfactory criteria of suitability must include some consideration of the individual child's fitness for, as well as the availability of, his chosen occupation. Possible criteria would, therefore, include:

(1) *Availability of Employment.*
   (*a*) By comparing children's choices with occupational distribution, according to the census.[12*]
   (*b*) By a follow-up to determine whether children do, in fact, achieve their ambitions.[1]
   (*c*) By comparison with the occupational achievements of similar groups of young people.[7]

(2) *Fitness of Candidate.*
   (*a*) By educational status.[11]
   (*b*) By general intelligence.[8, 15]
   (*c*) By special abilities.
   (*d*) By temperament and character.

Each of these criteria has been used at some time, although the last two mentioned have not produced much experimental evidence. Too little is known of occupational requirements in terms of these qualities, and the tests available have too little precision for use on a large scale, though they may produce interesting results in the hands of one expert with a small number of subjects.[11] In the present investigation the criteria of fitness were confined to general intelligence and educational background.

The investigation was carried out in the Borough of Ealing, in the County of Middlesex, mainly during the Summer term of 1948. It is not claimed that the subjects are a representative sample of the total population of Britain, nor that their occupational opportunities are comprehensive; the district is almost entirely urban or suburban, so that rural occupations are available only to those who are willing to leave home. There is, however, a wide variety of industries; although the main sources of employment are electrical engineering, mechanical engineering, and the distributive trades, no *one* industry makes the excessive demands noted in some other districts,[14] nor is there any lack of stimulation for vocational fancies generally thought to be characteristic of adolescents, since there exist, nearby, a famous film studio, a well-known professional football club and an airport.

The enquiry was confined to the secondary modern schools which contained nearly 75 per cent. of the total school population. Information about their vocational interests was obtained from the children by means of two supervised questionnaires. On the first the children were asked, "What job would you like to do when you leave school?" and "Why do you think you would like it?" There was also a list of eleven specified occupations for ranking by paired comparisons, and a final question, about unrestricted vocational phantasy, which was, "Suppose that, by some magic, you were suddenly grown up and could have everything you wish, what would you be?" In presenting this first questionnaire to a school class, the investigator explained that the answers given would be treated as confidential, and that the enquiry had no connection with the Youth Employment Bureau or any employer.

The second questionnaire was presented to the same children about one month after the first, whenever this was possible. On it the children were asked to give reasons for their choice of occupation, and to answer other questions about their earlier interests, their parents' occupations, their attitude to school subjects and other facts which might be relevant to vocational interest. In presenting the second questionnaire, the investigator reminded the children of the first, and pointed out that it did not matter if their plans had changed in the meantime. The children had already been given group verbal tests of intelligence

* References indicate investigations in which these criteria have been used.

at the age of 13 plus, and the results of these tests, Moray House Advanced V and VI, were made available.* In addition, the head teachers were asked for comments on the social and emotional adjustment of the children, who were then classified as normal, well adjusted or maladjusted.

To judge the appropriateness of each child's choice according to the relation between his general intelligence and the intelligence required by the occupation of his choice, use was made of the occupational intelligence standards published by Burt in 1926.[2] These standards recognised seven occupational grades, ranging from professional occupations said to require an I.Q. of 150 or more, down to the unemployable with I.Q. below 50. In spite of the fact that considerable time has elapsed since the publication of Burt's table, it has not been seriously challenged. The relative status of most of the occupations listed has been confirmed by Cattell[4] and, more recently, Vernon.[20] American norms based on testing in the second World War have been published,[16] but their accuracy is thought to be reduced by the differential effect of the retention of some employees in reserved occupations. For the present investigation, Burt's standards were supplemented where necessary from other sources.† Where there was a discrepancy between British and American norms, the British were preferred.

To judge the suitability of the choices on the criterion of availability, use was made of records in the Youth Employment Bureau. A study was made of the Bureau's placings for one whole year, 1st September, 1948, to 31st August, 1949. The resulting figures include about 50 per cent. of the school leavers concerned in the present investigation, together with other young people between the ages of fifteen and eighteen who sought the help of the Bureau. Some of these were children from other areas placed in Ealing, and some were Ealing children placed elsewhere, including some who found employment outside Middlesex. Care was taken to exclude all young people who had had educational opportunities other than those provided by the modern school.

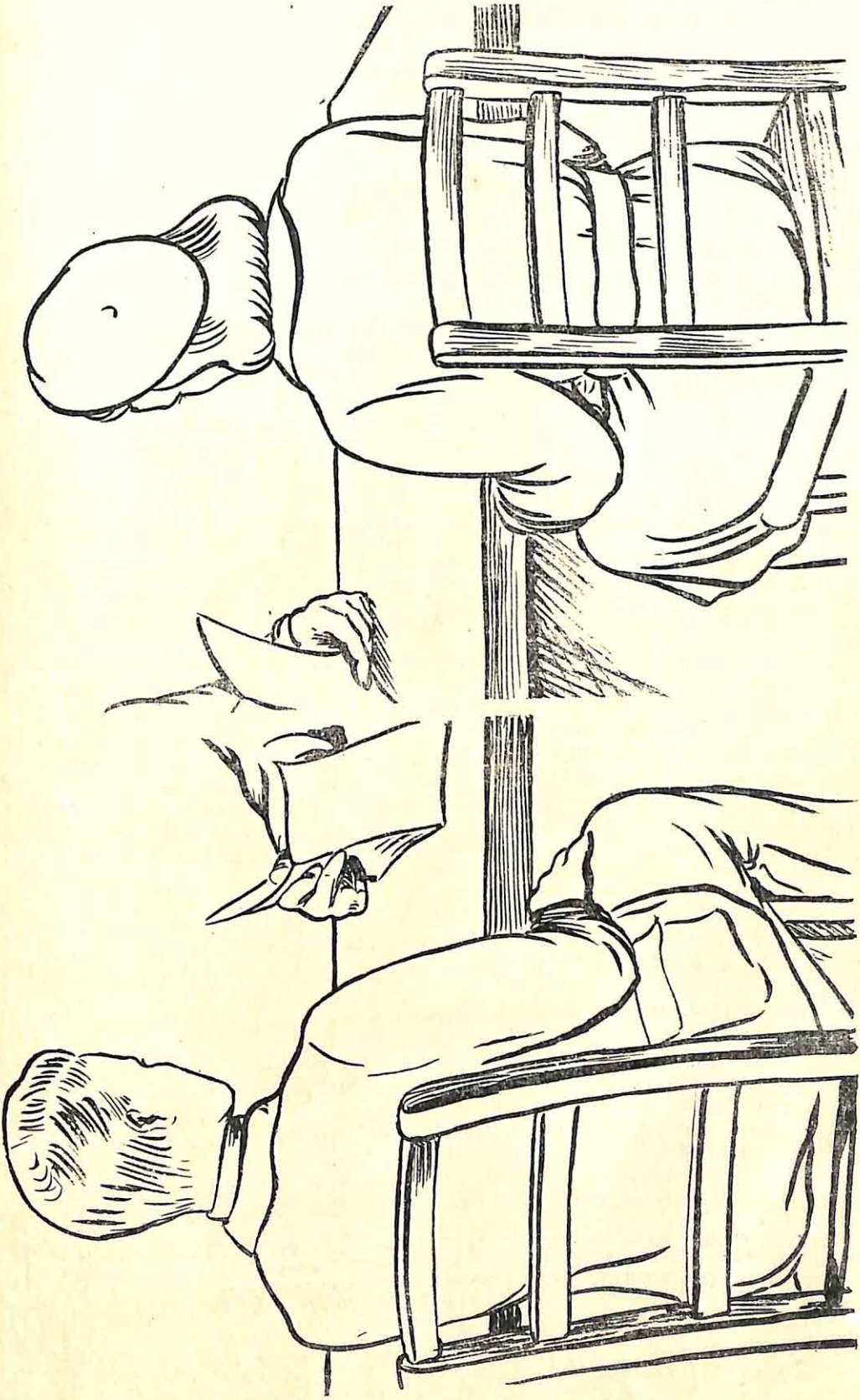
By means of records in the Youth Employment Bureau, it was possible also to follow up one group of children after they had left school at Easter, 1949. On the Youth Employment record card, Form YE1, there appears a statement of the child's vocational choice as expressed at an interview in the presence of the Youth Employment Officer, the head teacher, and—as a rule—the child's parent. Also on the card is a record of the occupation entered by the child on leaving school. These records were studied for two reasons : (1) to compare the child's choice on this occasion with that expressed seven months earlier in a different situation ; (2) to note the proportion achieving their ambitions. The follow-up was, therefore, at the same time a test of persistence of intention and practicality of choice.

Finally, in the Summer term, 1949, one year after the completion of the questionnaires, the schools were re-visited and a small number of children, chosen at random, were interviewed. A specially devised projection test of the story completion type was used, to gain insight into the less obvious motives for the preferences expressed on the questionnaires. The child was presented with the simple line drawing of a boy (or girl) being interviewed by a person of indeterminate sex whose hand alone was visible.‡ (See illustrations adjoining.)

* It was later found on restandardisation that these particular tests had underestimated the intelligence of Ealing children by about 2 I.Q. points.

† Including those already mentioned. Use was also made of *The Barr-Taussig Scale*, as used by Menger[12] and of Fryer's " Occupational Intelligence Standards," *School and Society*, 1922.

‡ The drawings resembled those in Raven's *Controlled Projection* (Methuen, 1944) and the idea of using the story completion method arose from experience of Mr. Raven's test in Child Guidance work.



He was then asked to make up a story about this boy (girl) who was fifteen and had just left school. The story, as shaped by questions, dealt with the young person's vocational plans, motives, early work experiences and final ambitions. On completion of the story, the child was asked whether or not he had identified himself with the boy in the story, and the answer to this question was used to introduce a discussion of the child's own attitudes towards his future employment.

SUMMARY OF NUMBERS INVOLVED.

	Boys	Girls
Total	824	801
Number answering first questionnaire	730	733
Number answering second questionnaire	641	664
Number answering both questionnaires	547	596
Number of I.Qs. known	675	643
Number followed up	114	106
Number interviewed	26	33
Number described as maladjusted	38	93†
Number described as well-adjusted	37	69

III.—RESULTS OF INVESTIGATION.

(*a*) *Occupations chosen.*

The first purpose of this investigation was to estimate, from data provided by the two questionnaires, the degree of realism shown by the children in their vocational *choice*, which is to be distinguished from vocational *preference*, *interest* and *phantasy*. The term *choice* can best apply to the statement of one or two occupations which the subject seriously considers entering upon; vocational *preference* involves comparison of the relative attractiveness to the subject of several occupations apart from the one which he intends to follow; vocational *interest* is a more general term which is, however, increasingly being reserved for objectively measured interests; *phantasy* refers to the completely free expression of a wish, without any consideration of expediency.‡ One of the most easily discernible weaknesses in early research on this topic was the tendency to condemn children's ambitions as unrealistic without adequate grounds for supposing that the choice stated was anything more serious than a passing whim or daydream which the child recognised as such. For this reason, the present estimate of realism will be based on the children's answers to the question, "What job would you like to do when you leave school?" The presentation of a list of occupations was avoided in this question on account of the likelihood that such a list has a suggestive influence which may result in the selecting of some attractive-sounding occupation, which the child has never previously considered.

A repetition of this question on the second questionnaire provided a check on the reliability of sampling and on the stability of the children's choice. Although the sample of children who answered the second questionnaire was not exactly the same as those who had answered the first, the relative popularity

† Including 23 described as nervous, shy, timid, withdrawn, fearful, or depressed. The number of maladjusted girls is greater than the number of maladjusted boys because two head mistresses gave exceptionally detailed comments on personality.

‡ For a recent discussion of these terms, see Super.[17]

of various occupations did not differ significantly* on the two occasions, except that rather fewer boys chose transport work on the second occasion. Stability of choice is indicated by the fact that of the 1,145 children who were present on both occasions, 81·3 per cent. of the boys and 83·7 per cent. of the girls repeated the same choice.

The most striking feature of the list of vocational choices given in Tables I and II is the almost complete absence of high grade professional occupations. The general picture is, in fact, remarkably similar to that found by Pallister, particularly in the proportion of boys choosing skilled and highly-skilled manual work. Five boys wished to be R.A.F. pilots, and six to be artists. Professions such as architecture, veterinary surgery and chartered accountancy, were chosen only once each. Of occupations classified as highly-skilled, those most frequently chosen by the boys were manual, usually electrical work. Manual work involving some degree of skill, accounted for 85 per cent. of the boys' choices. Verbal comments in fact, seemed to indicate that the boys looked upon manual work as the only kind of "real" work. In one school a boy remarked, "I would rather *work*—not just write about it." The rest of the class applauded this statement. Of the girls, none chose occupations from the highest professional grade, but nine wished to do secretarial work which was classified as semi-professional, even though most of the girls clearly thought of it as equivalent to shorthand-typing. Nine girls wished to be artists, status doubtful, and twelve air hostesses. Of the occupations classified as highly-skilled, the most frequently chosen were nursing and shorthand-typing. Teaching is not mentioned at all, except by four girls who wished to be P.T. instructors. Table III shows how few of the children aimed at occupations normally requiring grammar school education, but there are indications of ambition in the numbers choosing skilled and highly skilled work. The tendency was for a large proportion of the children to aim at occupations to which only the most able among them would be able to attain.

(*b*) *Vocational Choice Related to Industrial Needs of District.*

A child's choice may lead to disappointment, not because he lacks the general intelligence or specific abilities required by the occupation, but merely because there is little demand for workers in that field. Jahoda[9] found, for example, that too many children wanted to be printers, carpenters and hairdressers. Such disproportion is particularly liable to occur in districts where one industry makes excessively large demands. Where a wider variety of occupations is available, it is more likely that there will be something to suit all tastes. In the present investigation the comparison of interest and opportunity, as shown in Tables I and II, indicates closer agreement than might be expected, particularly in the choices of the boys. In fact, when only the broad occupational groupings are considered, the proportion of school-leavers choosing to enter an industry was almost exactly the same as the proportion of young people up to the age of eighteen who were placed in that industry by the Bureau. But more detailed analysis shows that of the 20 per cent. who wish to enter the broad group of occupations comprising building and woodwork, too many are interested in carpentry. In the engineering group, those choosing tool-making were almost certain to be disappointed since, in the year for which figures are available, only one boy from a secondary modern school was apprenticed to this trade. Other occupations more popular than available were printing, draughtsmanship and farming. It is interesting to note that office work of some kind, though not popular among the schoolboys, and not, on the whole, suited to their abilities,

* By the chi-square test, $p = \cdot 5$.

TABLE I

VOCATIONAL CHOICE RELATED TO AVAILABILITY OF OCCUPATIONS—BOYS.

OCCUPATION CHOSEN (Question 1.a)	No. of times chosen	Total	% Choice	% Actual Placings by Youth Employment Bureau
BUILDING				
Bricklaying	16			
Plumbing	23			
Other building work	24			
		63	7·6	11·2
WOODWORK	113	113	13·7	10·0
ELECTRICAL WORK	97	97	11·8	10·1
ENGINEERING				
Mechanical and Motor Engineering	119			
Toolmaking	19			
Other engineering and Metalwork	43			
		181	22·0	20·0
TRANSPORT				
Drivers	23			
Other Transport Workers	27			
		50	6·1	6·4
DEFENCE				
Air	10			
Sea	28			
Land	6			
		44	5·3	—
PRINTING	38	38	4·6	1·8
CLERICAL WORK	29	29	3·5	8·1
SHOPS	31	31	3·8	3·8
THE ARTS				
Writing, etc.	17			
Drawing	30			
		47	5·7	2·8
SPORT	11	11	1·3	—
FARMING	53	53	6·4	3·4
MISCELLANEOUS	53	53	6·4	22·5
DON'T KNOW	14	14	1·7	—

TABLE II

VOCATIONAL CHOICE RELATED TO AVAILABILITY OF OCCUPATIONS—GIRLS.

OCCUPATION CHOSEN (Question 1.a)	No. of times chosen	Total	% Choice	% Actual Placings by Youth Employment Bureau
SHOPS				
Unspecified	87			
Specified	46	133	16·6	20·9
OFFICE WORK				
Typist	32			
Shorthand-typist	62			
General office work	104	198	24·7	32·5
TELEPHONIST	33	33	4·1	3·2
NURSING				
Hospital or unspecified	34			
Nursery Nurse	62	96	12·0	2·6
FARMING	20	20	2·5	—
WORK WITH ANIMALS	15	15	1·9	—
DOMESTIC WORK				
Housework	12			
Cooking or Laundry Work	13	25	3·1	3·5
HAIRDRESSING	69	69	8·6	1·1
DRESSMAKING	100	100	12·5	8·6
FACTORY WORK	38	38	4·8	21·9
THE ARTS				
Not involving Self Display	17			
Involving Self Display	11	28	3·5	1·4
TRAVEL (Air Hostess)	10	10	1·2	—
MISCELLANEOUS	24	24	3·0	4·4
DON'T KNOW	12	12	1·5	—

TABLE III

GRADES OF OCCUPATION CHOSEN.

GRADE CHOSEN	BOYS		GIRLS	
	% of 824	% of 645*	% of 801	% of 675*
I Professional and II Semi-Professional	3·9	2·5	3·5	1·2
III Highly-Skilled	22·5	26·0	19·4	20·8
IV Skilled	35·5	40·5	52·3	55·4
V Semi-Skilled	32·0	25·0	20·1	19·4
VI Unskilled	6·1	6·0	4·7	3·2

* i.e., of those whose I.Q. was known. There is no reason to suppose that those who missed the intelligence test were a selected group.

was neverthless available for more than 8 per cent. of the youths placed by the Bureau.

The girls' choices were less in accordance with opportunity than those of the boys ; the proportion of girls placed in offices and shops was even greater than the considerable proportions who chose these occupations. Hairdressing, nursing and to some extent dressmaking were the choices most likely to lead to disappointment.

A *follow-up* of children leaving at Easter served the purpose of a check on stability of choice as well as showing how many of the children were actually able to enter the occupations they had chosen on the questionnaires. Permanence of choice is not to be expected with any group of children even after a few weeks, and in this investigation it was expected that the difference in the situations would produce even more marked changes. It has already been stated that there was more than 80 per cent. permanence of choice between the times of the first and second questionnaires—about one month. Where a group of fifty-five boys had been unable to complete the second questionnaire until three months after the first, the percentage of permanence had fallen to 69 per cent. Previous research would lead to the expectation of not more than 60 per cent. permanence after seven months, apart from differences in the method of collecting the data. The percentage of permanence found by the follow-up was, therefore, not very much less than might have been expected if the questionnaires had been repeated after this interval, being 57·9 per cent. (boys) and 51 per cent. (girls). The greater proportion of changes in the girls' intentions is significant in relation to their earlier preference for some occupations not readily available, particularly nursing and hairdressing. A study of the direction of changes made by both boys and girls indicates the abandonment of less practical ambitions. In many cases occupations mentioned on the questionnaires, but *not* to the Youth Employment Officer, were precisely those shown to be less available to school leavers in this area, such as :

Boys : *R.A.F.*,* *Navy*, *Ornithology*, Farming, Drawing, Carpentry, Sport.

Girls : *Air Hostess*, Dancing, Telephonist, Nurse, Hairdresser, Dressmaker, Farming, Journalist, Mannequin.

Printing was the exception to this general rule, since, although it was one of the occupations more popular than available, there was marked persistence of interest in it. It is interesting to note that the type of change between the first

* Those in italics did not appear at all on the Youth Employment record.

and second questionnaires due to mere lapse of time was not the same as the change noted at the Youth Employment interview. This comparison draws attention to an important distinction, between changes which indicate loss of interest, and those which are dictated by circumstances. In all, 61·4 per cent. of the boys and 78·5 per cent. of the girls were placed in occupations which they had chosen either on the questionnaires or in the Youth Employment interview; but where the choices were different the ambition more likely to be fulfilled was that stated in the presence of the Youth Employment Officer.

(*c*) *Vocational Choice Related to General Intelligence.*

The data presented in Section III (*a*) indicate that the children, though inclined to aim high, did not on the whole choose occupations impossible for them to attain for reasons of education, and Section III (*b*) suggests that disappointment is more likely to be due to the disproportionate popularity of some *types* of occupation. So far, however, the group has been considered as a whole without taking into account variations in ability within the group.

It may well be that there has been some over-emphasis on the factor of general intelligence in vocational success, particularly in occupations where specific abilities and qualities of personality seem likely to make an important contribution; and some attempts have been made to estimate the importance of the factor by correlating success in work with scores on intelligence tests.* In a recent publication, Super[17] comments on the lack of evidence on the importance of general intelligence in skilled manual work. The possibility exists, therefore, that in the occupations which were chosen by so many of the boys taking part in this investigation, general intelligence is not the most important factor. It remains, however, the most measurable.

Of the total group of 1,625 children taking part in the present investigation, only 675 boys and 634 girls had worked the Moray House tests. The boys had a mean I.Q. of 92·52, with standard deviation of 11.11, and the girls a mean of 93·36, with standard deviation of 11·41. In both groups the distribution around the mean was negatively skewed on account of the earlier transfer to grammar and technical schools of the most intelligent boys and girls. The proportions of children making choices in accordance with their intelligence are shown in Table IV.

TABLE IV

APPROPRIATENESS OF CHOICE IN RELATION TO GENERAL INTELLIGENCE.

	PERCENTAGES	
	Boys	Girls
Choice below ability	3·6	2·4
Correct choice	36·1	36·8
Choice one grade too high	32·2	36·1
Choice two grades too high	23·7	20·8
Choice three grades too high	4·4	3·9
TOTAL	N=645	N=634

At first sight it appears that 60·3 per cent. of the boys and 60·8 per cent. of the girls were over-ambitious; but there are reasons for which such a statement

* See Burtt.[3]

would be misleading. Allowance must be made for the tendency of the children to use rather imposing names for comparatively modest intentions. This was particularly true of boys wishing to do electrical work. While the neighbourhood provides ample opportunity for skilled and semi-skilled work in electrical engineering, most of the boys used the term ' electrician ' which is classified as highly skilled. Moreover, since the group included children of the lowest but not the highest employable grades, there was more likelihood of their choosing too high than too low merely by choosing at random.* For these reasons† a child was considered to have made a *reasonable* choice if he selected an occupation from the grades adjacent to his own. On this basis, 71 per cent. of the boys and 75 per cent. of the girls made reasonable choices.

The tendency of the children to aim high, without going beyond the scope of the group as a whole, gave the impression that the more intelligent children were more realistic. They certainly chose more appropriately, because they would generally be preferred to less intelligent children seeking the same employment. Table V shows how, as the intelligence of the children increases, so does the proportion of correct choices. This does not necessarily mean, however, that more intelligent children are better able to appraise their own capabilities.

TABLE V

RELATION BETWEEN INTELLIGENCE AND APPROPRIATENESS OF CHOICE.

INTELLIGENCE LEVEL	Per cent. reasonable choice	
	Boys	Girls
Dull (I.Q. below 85)	51·7 (N=143)	34·8 (N=144)
Low Average (I.Q. 85—99)	68·5 (N=327)	79·6 (N=280)
High Average (I.Q. 100 plus)	94·9 (N=175)	97·1 (N=210)
WHOLE GROUP	71·9	75·3

Better evidence, though still not conclusive, is provided by the tendency of brighter children to choose higher grades: In the present investigation, correlations were found of ·335 plus or minus ·036 (boys) and ·284 plus or minus ·037 (girls) between intelligence and grade of vocational choice. Although these correlations appear small, they are statistically significant in relation to their standard errors, and highly significant in view of the limited range of intelligence in the group. They are, in fact, equivalent to a correlation of ·71‡ over the whole population, provided that it can be assumed that grammar school children, if included in the investigation, would have chosen occupations from the higher

* The same law, operating in the reverse direction, would account to some degree for 41 per cent. of Hecker's girl subjects who chose too low.

† And also the underestimation of the I.Q. See above.

‡ The correlations were corrected for limited range by the formula:

$$\frac{\text{S.D.}_s}{\text{S.D.}_l} = \frac{\sqrt{1 - r^2_l}}{\sqrt{1 - r^2_s}}$$

when S.D._s is the standard deviation of the smaller group and S.D._l is the standard deviation of the larger group.

r_s is the obtained correlation.

r_l is the correlation to be calculated.

grades—which is practically certain. A marked relationship has, therefore, been established between the intelligence of the children and the intelligence required for their chosen occupations, which suggests a possibility that the children have some ability to assess their vocational opportunities in relation to their fellows. Caution must, however, be observed in drawing this conclusion, since the more intelligent children are more likely to have parents in higher occupational grades. It may, therefore, be evidence of appropriateness of choice without demonstrating that the children are capable of realistic self-appraisal.

Having established that more intelligent children tended to choose higher occupational grades, it is interesting to enquire whether any *types* of occupations attracted the brighter pupils. The cross tabulation of I.Q. with occupation chosen had features in common with tables showing the intelligence of workers actually found in those occupations. Within each group there was a wide range of intelligence, but the means were significantly different in some cases. Boys choosing clerical work and the Service were among the most intelligent, and those choosing the building industry were least intelligent*. Boys choosing the engineering trades were, on the whole, more intelligent than those choosing the building trades (Critical Ratio=3·3), and this remains true when woodworkers are included with the building workers and electricians with the engineering workers (Critical Ratio=3·5). Prospective woodworkers were *not*, however, less intelligent than prospective mechanics; and were, on the whole, *more* intelligent than those choosing other building trades, such as bricklaying, painting and decorating (Critical Ratio=2·02). Of the *girls*, the most intelligent were those wishing to be shorthand-typists and the least intelligent those choosing factory work.† Girls wishing to work in shops covered the normal range, but there was a marked tendency for the more intelligent to specify the type of shop which they would prefer (Critical Ratio=3·3). A similar tendency may contribute to the lower mean I.Q. of girls wishing to be typists rather than shorthand-typists, and to the generally low scores of those choosing factory work, without, in some cases, any further detail. There was also a slight, though not statistically significant, superiority of those choosing *Children's* nursing over those not specifying the type. The five most popular broad occupational groups attracted girls in the following descending order of average intelligence; clerical work, shops, hairdressing, dressmaking and nursing. Those girls choosing various kinds of office work were significantly more intelligent than each of the other groups except hairdressing, in which the number was rather small. Since clerical work does make greater demands on intelligence than many other occupations, these differences in some cases merely reflect the correlation between intelligence and grade of occupation chosen; but this is notably untrue in the case of nursing, which, though it attracted girls of slightly lower than average intelligence, is nevertheless, one of the most highly-skilled occupations chosen by the girls. Girls choosing nursing were, therefore, less realistic in view of the intellectual demands of the profession.‡

(*d*) *Vocational Preferences as Revealed by Paired Comparisons.*

Wilkins[21] has recently pointed out that the relative importance of incentives cannot be adequately estimated by asking each worker what he considers most

* Mean I.Q.s: Clerical workers, 98·43±1·77
Services, 96·29±1·49
Building, 87·00±1·65

† Mean I.Q.s: Shorthand typists, 100·63±1·16
Factory workers, 87·00±2·36

‡ It should not, of course, be overlooked that children's nursing demands less intellectual ability than hospital nursing.

important. A different picture was obtained by presenting the workers with a list of possible incentives to be ranked in order of importance. It is to be expected that a similar law will operate in a study of children's attitudes to occupations; and while the free choice method is suitable for estimating appropriateness of choice, it does not necessarily provide the truest picture of the relative popularity of various occupations. It is reasonable to suppose that when a child is asked what job he would like to do when he leaves school, his answer will bear some relation to what he considers to be his abilities or opportunites. The paired comparisons method, as used in the present inquiry, seems to demand no such consideration, since the child is compelled to choose one of each pair, even if he should feel ill adapted to either. The actual lists presented to the children prevented totally unsuitable preferences, because the eleven occupations had been chosen as within the scope of the children and available in the district.* Their relative popularity is shown in Table VI. By

TABLE VI

VOCATIONAL PREFERENCES REVEALED BY PAIRED COMPARISONS.

BOYS' OCCUPATIONS	Mean Rank	GIRLS' OCCUPATIONS	Mean Rank
1.—Mechanic	3·58	Shop Assistant	3·82
2.—Electrician	3·70	Hairdresser	4·32
3.—Carpenter	3·83	Typist	4·34
4.—Bus Driver	5·13	Nurse	4·71
5.—Bricklayer	6·03	Cashier	4·74
6.—Plumber	6·08	Dressmaker	5·23
7.—Factory-hand	6·67	Cook	6·34
8.—Bus Conductor	6·96	Bus Conductor	6·92
9.—Shop Assistant	7·10	Factory Worker	7·64
10.—Railway Porter	7·51	Domestic Servant	7·72
11.—Clerk	7·81	Laundress	8·08

the paired comparisons method, electrical work and hairdressing were shown to be even more attractive to boys and girls, respectively, than had appeared from the vocational choices. Other occupations, for example, bricklaying and plumbing, which were chosen by relatively small numbers of boys, were shown by this method to be moderately popular. This is important since it means that boys entering the building industry in the hope of becoming carpenters would presumably not find these alternative trades unattractive. Clerical work, on the other hand, which was chosen by a substantial number of boys, was the most unpopular in the group as a whole, as if boys either welcomed the idea of this work or rejected it with vigour.

Among the girls, work in *shops* was shown by the paired comparisons method to be the most popular of the eleven specified occupations, not because it was most frequently ranked first, but because few girls actively disliked it. Dressmaking, on the other hand, which was placed first by a similar number of girls, was also disliked by a substantial number, while comparatively few gave it an intermediate position.

In general, the investigation of preference by means of paired comparisons confirmed the popularity of the three skilled trades—Mechanic, electrician and carpenter—among the boys, and shop work, typing, hairdressing, and nursing,

* Three building trades were included to fit in with the work of the Building Research Unit (M.R.C.) at Birkbeck College.

among the girls. There was also a tendency, consistent with the impression that the children were on the whole ambitious, for the most popular occupations to be among the more highly-skilled. This tendency can be measured by the correlation between the mean ranks of the eleven occupations and their intelligence requirements. These were ·47 for boys' occupations, and ·87 for girls'. The lower correlation in the case of the boys is due to their attitude to clerical work, which was the most highly-skilled but least popular. This suggests that occupations requiring more intelligence were more popular only up to a point ; and it would be unwise to predict the continued preference for higher grades if professional occupations had been included in the list.

As might be expected, the relation between intelligence and vocational *preference*, as revealed by the paired comparisons was less marked than that between intelligence and vocational *choice*. There was found, however, to be some tendency for certain occupations to appeal more to brighter boys and girls. On the whole, the skilled work of the electrician and mechanic appealed to the more intelligent boys, while some transport work appealed to the less intelligent. Small, but statistically, significant correlations between intelligence and preference for particular occupations were :

Electrical : r=·217*
Mechanic : r=·164

Significant negative correlations were :

Railway porter : r=—·172
Bus conductor : r=—·137
Bricklayer : r=—·102

Preference for the other six occupations showed zero or negligible correlations with intelligence.

In relating the girls' preferences to their intelligence, the following significant positive correlations were obtained :

Cashier : r=·146
Typist: r=·119
Cook : r=·083

Significant negative correlations were :

Dressmaker : r=—·122
Factory girl : r=—·150

Preference for the other six occupations showed negligible relationship with intelligence. On the whole, those preferred by the most intelligent girls were occupations having an obvious connection with proficiency in fundamental school subjects. The negative correlation of intelligence with preference for dressmaking may possibly be connected with its popularity in some classes for backward girls, where the teacher had made a special feature of needlework on account of the opportunities of success it gives to girls not gifted in academic work. With reference to nursing—the most highly-skilled of the eleven occupations—it is interesting to note the absence of any tendency for it to appeal to the more intelligent girls. This is further evidence that the intellectual demands of this work may be overlooked by those seeking it.

IV.—DISCUSSION.

The study of vocational choice in this one Borough has shown the children to be ambitious, but not excessively so. Less than 5 per cent. chose occupations unsuited to their educational standing as pupils of the secondary modern

* Standard errors do not, in any case, exceed ·04.

schools. The attitude of the boys to clerical work was particularly interesting, in view of the widely held opinion that ' white-collar ' occupations are generally preferred.* The present investigation does not disprove the existence—or the importance—of an occupational drift away from productive work, but it does draw attention to the error of concluding that attitudes discovered in one social group are prevalent in the population as a whole.† In the present group of secondary modern schoolboys only those comparatively successful in English and Mathematics chose office work ; the rest rejected it with an excess of vigour bearing some resemblance to the attitude of the fox who found that the grapes were hanging too high. Their realisation that they would not enjoy the work was probably genuine ; but the attempt made by many to deny its prestige had in it a suggestion of over-compensation.

The tendency to ambition is shown by the fact that between 25 per cent. and 30 per cent. chose occupations well beyond the scope of their general intelligence ; the proportion making ' correct ' choice was actually smaller than that found in some previous investigations.[8, 15] A study of the nature of the inappropriate choices suggests that the error was perhaps in the terms used more than in the choice itself ; many of the inappropriate choices were for occupations such as electrical engineering, office work (girls) and dressmaking (girls), which do provide scope for less skilled workers. Further evidence of appropriateness of choice is provided by the tendency of the more intelligent pupils to choose occupations making greater demands on intelligence. An exception to this general rule was the absence of any tendency for nursing to be preferred by the brighter girls. When the choices were compared with the industrial needs of the district, the agreement in the case of the boys was remarkably high, although carpentry, printing and toolmaking were disproportionately popular, and office work too little sought after. There was considerable disproportion in the numbers of girls choosing nursing, hairdressing and dress-making. It should be noted, however, that the occupations which were disproportionately popular, such as carpentry and dressmaking, are not in themselves unsuitable to the children. The lack of accordance between choice and opportunity indicates that some‡ of the children will have to readjust their ideas, but not that these ideas were unsound. Only in a Brave New World could choice and opportunity be perfectly adjusted.

The follow-up of the children leaving at Easter showed that those who had previously desired the less available occupations frequently modified their wishes in the Youth Employment interview. The girls made this kind of modification more frequently than the boys, having more need.

The vocational preferences of the children revealed by the method of paired comparisons bears a less marked relation to the abilities of the children than the vocational choice.

The general impression left from this study of vocational choice is in conformity with Freeston's suggestion[6] that children tend to aim at the highest levels available to the group to which they belong. If this hypothesis is correct, it follows that the segregation of children into different types of secondary schools will have a profound effect on their attitude to vocations. Children of average ability, when educated separately from the highly-gifted, will be less

* In his Presidential Address to Section J of the British Association, on 9th August, 1951, Professor C. A. Mace referred to a ' fundamental weakness of our civilisation ' which he called ' the drift to the West,' i.e., away from industry towards the professions.

† Professor Mace's statement may be truer of attitudes fostered by higher education. Cf. Sir Ewart Smith : *The Advancement of Science*, Vol. VII, No. 27, p. 305.

‡ Perhaps 30 per cent. of the girls—fewer boys.

likely to adopt inappropriate ambitions. Hence the difference already noted between the attitudes to professional occupations of British and American children.

Evidence from the present investigation suggests that children in the secondary modern schools show a healthy desire to climb to the top of the tree, but little yearning to move into another part of the forest, where there are taller trees.

(To be concluded.)

REFERENCES

[1] BARNES, EARL : " Children's Attitudes Towards Future Occupations," *Studies in Education*, II (Stanford, 1902).
[2] BURT, C., and others : " A Study in Vocational Guidance," I.H.R.B. Pamphlet, XXXIII, 1926.
[3] BURTT, H. E. : *Principles of Employment Psychology* (New York, 1942).
[4] CATTELL, R. B. : " Occupational Norms of Intelligence, etc.," *Brit. J. Psych.*, XXV, 1935.
[5] FRANK, L. K. : " The Reorientation of Education to the Promotion of Mental Hygiene," *Mental Hygiene*, XIII, 1939.
[6] FREESTON, P. M. : " The Vocational Interests of Children ," *Occupational Psych.*, XIII, 1939.
[7] HAWKINS, A. D. : " Work of a Central School in Relation to the Future Occupations of its Pupils," M.Sc. Thesis, Birmingham, 1933.
[8] HECKER, W. R. : " A Study of Choice of Occupation among Secondary School Children," M.A. Thesis, London, 1937.
[9] JAHODA, G. : " Adolescent Attitudes to Starting Work," *Occupational Psych.*, XXIII 1949.
[10] KITSON, H. D. : *The Psychology of Vocational Adjustment* (Philadelphia, 1925).
[11] MACRAE AND MILNER : " Interest and Ability," *J. Nat. Inst. Ind. Psych.*, V. 1930.
[12] MENGER, C. : *Significance of Vocational Choices of School-children* (New York, privately printed, 1932).
[13] MOSER, W. E. : " Vocational Preference as Related to Mental Ability," *Occupations*, XXVII, 1949.
[14] PALLISTER, H. : " Vocational Preferences of School Leavers in a Scottish Industrial Area," *Occ. Psych.*, XII, 1939.
[15] STEPHEN, J. L. : " Occupational Interests in Relation to Intelligence," M.A. Thesis, London, 1938.
[16] STEWART, N. : " A.S.C.T. Scores of Army Personnel Grouped by Occupations," *Occupations*, XXVI, 1947.
[17] SUPER, D. E. : *Appraising Vocational Fitness* (New York, 1949).
[18] TROW, W. C. : " Phantasy in Vocational Choice," *Occupations*, XX, 1941.
[19] VALENTINE AND RITCHIE : " Reasons for Choice of Occupation Among Secondary School Pupils," *Forum of Education*, V, 1927.
[20] VERNON, P. E. : " Variations of Intelligence with Occupation, Age and Locality," *Brit. J. Psych (Statistical Section)*, 1947.
[21] WILKINS, L. T. : " Incentives and the Young Worker," *Occupational Psych.*, XXIII, 1949.

THE INFLUENCE OF READING ABILITY IN ENGLISH ON THE INTELLIGENCE TEST SCORES OF WELSH-SPEAKING CHILDREN

By W. R. JONES
(*Lecturer in Education, University College of North Wales, Bangor*).

I.—*Introduction.* II.—*Experimental groups and tests.* III.—*Test results.* IV.—*Further statistical analysis of results.* V.—*Discussion of findings.* VI.—*Summary and conclusions.* VII.—*Appendix.*

I.—Introduction.

In a previous paper[1] the writer described an investigation which was undertaken in order to find whether the performance of Welsh-speaking (bilingual) children in a verbal intelligence test in English differed significantly from their performance in a non-verbal test administered in Welsh. The results showed that their mean verbal I.Q. was significantly lower than their mean non-verbal I.Q., owing to inadequate reading ability in English. It also appeared that the difference observed between the two means tended to diminish as reading age in English increased, although the gap between them was not entirely closed even with reading ages as high as 10 : 0 or 11 : 0 (pre-war level).

The purpose of the present inquiry was to obtain further information about the influence of reading ability in English on the scores of Welsh-speaking (bilingual) children in an English intelligence test.

II.—Experimental groups and tests.

Two random groups of children were obtained from an English-speaking and a Welsh-speaking area of Caernarvonshire, respectively. They consisted of all those present in school on the day of testing whose ages fell between 10 : 0 and 12 : 0. Answers given by the children themselves to a detailed Language Questionnaire* showed that one group was monoglot English and that the other was composed entirely of children who came from homes where Welsh was always spoken and whose knowledge of English had been acquired outside the home, mainly in school. Head teachers were also asked to classify the children according to language background, and in each case their assessment agreed with the results obtained from the questionnaire.

Three tests were used as follows :

(i) Jenkins's Scale of Non-verbal Mental Ability was used to measure I.Q. relatively free from the reading factor. It was given in English to the monoglot group and in Welsh to the bilingual group. Emmett[2] has shown that the test has a high saturation with the general factor and that it is free from the spatial factor and practically free from the verbal factor.

(ii) Moray House Intelligence Test 42 was used to measure I.Q. involving reading ability, and it was given in English to both groups. Moray House tests have a high saturation with the general factor and also a significant one with the verbal factor.[3]

(iii) Schonell's Silent Reading Test B (Test R. 4) provided a measure of the reading ability of both groups in English on the basis of new norms now available for this test.[4]

* This questionnare, devised by a research panel of the Collegiate Faculty of Education at Bangor, along lines similar to Hoffman's Bilingual Scale, enables pupils to be classified into three broad groups, as follows : Those who are (i) definitely Welsh ; (ii) definitely English ; and (iii) linguisitically mixed.

III.—TEST RESULTS.

(*Details of the tests of significance referred to in this section are given in an Appendix of Statistical Tables.*)

The first task was to discover whether the two groups, monoglot and bilingual, differed significantly in non-verbal intelligence. It was found that there was no significant difference. It also appeared that there was no significant difference in *variability* of scores between the two samples.* The mean scores of both groups in the verbal intelligence test were then compared. It was evident that there was a highly significant difference of 10·63 points of I.Q. in favour of the monoglot group.

A comparison of the two groups in respect of reading ability in English showed that the bilingual group was significantly inferior to the monoglot group. The mean difference amounted to 7·90 points of R.Q.

IV.—FURTHER STATISTICAL ANALYSIS OF RESULTS.

(*Full details of the statistical analysis are given in the Appendix.*)

The results in the previous section indicated that there were in the enquiry two groups, monoglot and bilingual, which, in spite of their equality in intelligence as measured by a non-verbal test, differed significantly in a verbal intelligence test. Apparently the verbal factor in the Moray House Test, being mainly due to the amount of reading required of the testee,[5] adversely affected the scores of the bilingual group owing to their inferior reading ability in English. It was, therefore, desirable to find whether the difference in verbal intelligence remained significant, if the two groups, which were already known to be similar in non-verbal intelligence, were also equated as regards reading ability in English. This was done by adjusting the verbal intelligence scores to a common reading basis by the methods of analysis of covariance. In this manner, the superiority of the monoglot group was reduced from 10·63 to 6·27 points of I.Q. It was evident, however, that this ' residual ' difference remained highly significant.

Correlation and regression coefficients in the two groups were also compared. Since no significant differences were found, it was legitimate to consider a way of averaging the respective coefficients.

V.—DISCUSSION OF FINDINGS.

Our results show that monoglot (English) and bilingual (Welsh) groups, which are equal in non-verbal intelligence and ' matched ' in respect of reading ability in English, may still differ significantly in an English verbal intelligence test. Apparently, some factor or factors other than intelligence and ability to comprehend printed material in English account for the significant difference between their adjusted means in verbal intelligence.

Answers given by the bilingual pupils to the Language Questionnaire showed that they have little opportunity of using English *actively* in their out-of-school environment; it was also evident that the teaching of English as a second language in the schools does little to remedy this situation; oral work, for example, is often neglected, and speaking the language is seldom given the first place in the syllabus. For these reasons, it is tentatively suggested that the ' residual ' inferiority of the bilingual children in the English verbal intelligence test, as shown by the analysis of covariance, may be due to the fact that

* $F=\frac{\sigma_1^2}{\sigma_2^2}=\frac{198\cdot77}{153\cdot81}=1\cdot29$, d.f. : $n_1=50$ and $n_2=63$.

they find it difficult to " think in English " with an adequate degree of facility and accuracy as a result of their manner of training and of a linguisitc environment in which the passive rather than the active aspect of English as a second language predominates. This, however, does not mean that they are similarly handicapped in verbal thinking which may be carried on through the medium of their mother-tongue. Indeed, there is some evidence to the contrary in the present enquiry ; the bilingual group, in addition to the tests already described, were given a group verbal intelligence test in Welsh,* and it was found that their performance on this test did not differ significantly from that in the non-verbal test of intelligence.†

Finally, it is emphasised that any conclusions which may be drawn from the present enquiry are bound to be extremely tentative in character, and that further researches are required into the relation between bilingualism and efficiency in thinking, particularly in verbal thinking, where any confusion as a result of bilingualism will be most in evidence ; such researches will need careful planning in the light of what is already known about the whole relationship of language and thought.

VI.—Summary and conclusions.

1.—This investigation was undertaken in order to obtain further information about the influence of reading ability in English on the scores of Welsh-speaking (bilingual) children in an English group verbal intelligence test. Two groups, aged 10 : 0 to 12 : 0, were obtained, and the results of a Language Questionnaire showed that the one consisted of monoglot English children, and the other of Welsh bilingual children, who came from homes where Welsh was always spoken, and whose knowledge of English as a second language had been acquired outside the home, mainly in school. Both groups were given the following tests : Group non-verbal and verbal tests of intelligence, and a silent reading test in English. The non-verbal test was administered in Welsh to the bilingual group, and in English to the monoglot group. The other two tests were given entirely in English to both groups.

2.—No significant difference was found between the two groups in mean and variability of scores on the non-verbal test.

3.—A highly significant difference was found in favour of the monoglot group in both the verbal intelligence test and the silent reading test.

4.—Since the two groups were already known to be similar in intelligence as measured by a non-verbal test, an analysis of covariance was carried out in order to discover whether the difference observed in favour of the monoglot group in the verbal intelligence test remained significant, when the two groups were also equated for reading ability in English. As a result of adjusting the

* This test was an adaptation into Welsh of Jenkins's Cotswold Mental Ability Test, Series I.

† Raw scores in both tests were converted into *standard scores* with a mean of 100 and a standard deviation of 15. The difference between mean non-verbal and mean verbal standard score was tested for significance according to Lindquist's method for related measures (Lindquist : *Statistical Analysis in Educational Research.* New York : Houghton Mifflin Co., 1940, pp. 58-59). The results were as follows :

n	SD	SD^2	Sd^2	Mean Diff.	*t*	d.f.
51	4	19472	19471·69	0·08	0·03	50

The observed value of *t* is insignificant.

verbal intelligence scores to a common reading basis, the difference was substantially reduced, but remained highly significant. It is tentatively suggested that this 'residual' difference is attributable to the fact that the bilingual children, as a result of their linguistic environment both in and out of school, have not yet acquired the ability to "think in English" with an adequate degree of facility and accuracy.

5.—The bilingual group was also given a group verbal intelligence test in Welsh; since their mean I.Q. in this test did not differ significantly from their mean I.Q. in the non-verbal test, it appears that they are not handicapped in verbal thinking which may be carried on through the medium of Welsh.

6.—The regression of verbal intelligence scores on reading ability scores and the correlation of verbal intelligence with reading ability proved to be similar for both monoglot and bilingual groups.

7.—The enquiry suggests that a group verbal intelligence test in English may not give an accurate I.Q. assessment for Welsh-speaking children, even after full allowance has been made for their inferior reading ability in English.

APPENDIX

Statistical Tables

The difference between monoglot and bilingual groups in non-verbal intelligence is tested for significance in Table I:

TABLE I

Comparison of Monoglot and Bilingual Groups in Non-Verbal Intelligence.

Groups	n	Degrees of Freedom	Mean Score	Sum of Squares
Monoglot	64	63	99·00	9,690·00
Bilingual	51	50	96·90	9,938·51
Sum or Difference ...	115	113	2·10	19,628·51

Pooled Variance (s^2): $19,628 \cdot 51/113 = 173 \cdot 70$.

Standard Error of Mean Difference ($sd = \sqrt{s^2(n_1+n_2)/n_1n_2}$): 2·47.

Critical Ratio: $t = 2 \cdot 10/2 \cdot 47 = 0 \cdot 85$.

The observed value of t reveals no significant difference between the two groups.

The results of both groups in the verbal intelligence test are compared in Table II:

TABLE II

Comparison of Monoglot and Bilingual Groups in Verbal Intelligence.

Groups	n	Degrees of Freedom	Mean Score	Sum of Squares
Monoglot	64	63	101·81	9,585·75
Bilingual	51	50	91·18	6,237·41
Sum or Difference ...	115	113	10·63	15,823·16

Pooled Variance (s^2): $15,823 \cdot 16/113 = 140 \cdot 03$.

Standard Error of Mean Difference ($sd = \sqrt{s^2(n_1+n_2)n_1n_2}$): 2·22.

Critical Ratio: $t = 10 \cdot 63/2 \cdot 22 = 4 \cdot 79$.

Since the observed value of t lies well beyond the 1 per cent. point for 113 degrees of freedom, it is evident that there is a highly significant difference in favour of the monoglot group in verbal intelligence.

Table III compares the two groups in respect of reading ability in English :

TABLE III

COMPARISON OF MONOGLOT AND BILINGUAL GROUPS IN READING ABILITY IN ENGLISH.

Groups.	n	Degrees of Freedom	Mean Score	Sum of Squares
Monoglot	64	63	93·72	15,252·94
Bilingual	51	50	85·82	10,801·41
Sum or Difference....	115	113	7·90	26,054·35

Pooled Variance (s^2) : 26,054·35/113=230·57.
Standard Error of Mean Difference ($s_d=\sqrt{s^2(n_1+n_2)/n_1n_2}$) : 2·85.
Critical Ratio : t=7·90/2·85=2·77.

The observed value of t lies beyond the 1 per cent. point for 113 degrees of freedom, and clearly indicates that the bilingual group is significantly inferior to the monoglot group in reading ability in English.

The next step is to find whether monoglot and bilingual groups of equal non-verbal intelligence differ significantly in verbal intelligence, when the scores for the latter variable have been adjusted to a common reading basis. This is done by an analysis of covariance (6). The data required for this purpose are given in Table IV. :

TABLE IV

SCORES OF MONOGLOT AND BILINGUAL GROUPS : (X=READING QUOTIENT, Y=MORAY HOUSE I.Q.).

Groups.	n	SX	SY	SX^2	SY^2	SXY
Monoglot	64	5,998	6,516	577,378	672,996	618,727
Bilingual	51	4,377	4,650	386,451	430,208	405,394
Experimental Totals....	115	10,375	11,166	963,829	1,103,204	1,024,121

The results of the analysis of covariance are shown in Table V :

TABLE V

REGRESSION AND CORRELATION IN MONOGLOT AND BILINGUAL GROUPS.

Groups	Degrees of Freedom	Sum of Squares and Products			Correlation Coefficient[1]	Regression Coefficient[2]	Errors of Estimate	
		Sx^2	Sxy	Sy^2			Sum of Squares[3]	Degrees of Freedom
Monoglot ..	63	15,252·94	8,055·62	9,585·75	0·666	0·528	5,331·29	62
Bilingual ...	50	10,801·41	6,314·59	6,237·41	0·769	0·585	2,545·85	49
Sum	—	—	—	—	—	—	7,877·14	111
Average within groups	113	26,054·35	14,370·21	15,823·16	0·708	0·552	7,974·84	112

[1] $\frac{Sxy}{\sqrt{(Sx^2)(Sy^2)}}$ [2] $\frac{Sxy}{Sx^2}$ [3] $Sy^2-\frac{(Sxy)^2}{Sx^2}$

Useful information may also be obtained by a comparison of group regression and correlation coefficients in Table V.

First of all, however, it is necessary to calculate the sum of squares of errors of estimate, that is, the adjusted sum of squares for the experiment *as a whole*. The *experimental totals* in Table IV provide the relevant data for this purpose. Correction terms are $\frac{(SX)^2}{N}$, $\frac{(SY)^2}{N}$, $\frac{(SXY)^2}{N}$, which are applied respectively to SX^2, SY^2, and SXY to obtain Sx^2, Sy^2, and Sxy. The adjusted sum of squares for the experiment as a whole, is then obtained from the formula $Sy^2 - \frac{(Sxy)^2}{Sx^2}$. The value of this adjusted sum of squares is 8,945·98, and its number of degrees of freedom is one less than the number for the total sum.

The difference between adjusted group means in verbal intelligence is now tested for significance in Table VI :

TABLE VI

TEST OF SIGNIFICANCE OF DIFFERENCE BETWEEN ADJUSTED MEANS IN VERBAL INTELLIGENCE.

Source of Variation	Errors of Estimate		
	Degrees of Freedom	Sum of Squares	Mean Square
Total	113	8,945·98	—
Average within groups	112	7,974·84	71·20
Between adjusted means ..	1	971·14	971·14

Adjusted means : Monoglot group, 99·88 ; bilingual group, 93·61
Difference between adjusted means : 6·27.
$F = 971/71 = 13·68$.

The adjusted means are derived from the formula, $Y - bx$, where Y is the unadjusted group mean in verbal intelligence, x the deviation of the group mean in reading ability from the general mean for the same variable, and b the average regression coefficient within groups as found in Table V. The observed value of F indicates that the difference between adjusted means remains highly significant.

The test of significance between regression coefficients is carried out in Table VII :

TABLE VII

TEST OF SIGNIFICANCE BETWEEN REGRESSION COEFFICIENTS FOR MONOGLOT AND BILINGUAL GROUPS.

Source of Variation	Errors of Estimate		
	Degrees of Freedom	Sum of Squares	Mean Square
Average within groups	112	7,975	—
Deviations from individual group regressions.....	111	7,877	71
Between regression coefficients	1	98	98

$F = 98/71 = 1·38$.

Since the observed value of F is insignificant, one may conclude that the regression of Verbal Intelligence scores on Reading scores is fundamentally the same in both groups.

The difference between the group correlation coefficients for reading ability and verbal intelligence is tested for significance according to the method described by Snedecor[6] :

TABLE VIII

TEST OF SIGNIFICANCE OF THE DIFFERENCE BETWEEN TWO CORRELATIONS OF READING ABILITY WITH VERBAL INTELLIGENCE.

Group	n	r	z	1/(n −3)
Monoglot	64	0·666	0·803	0·016
Bilingual	51	0·769	1·018	0·021
		Difference=0·215	Sum=0·037	
$s_d=\sqrt{0\cdot037}=0\cdot192$		$t=0\cdot215/0\cdot192=1\cdot120$		

The observed value of *t* is insignificant, and one may, therefore, conclude that the correlation of reading ability with verbal intelligence does not differ significantly in the two groups.

REFERENCES

[1] JONES, W. R. (1952) : "The Language Handicap of Welsh-speaking Children," *Brit. J. Educ. Psych.*, XXII, 114-123.
[2] EMMETT, W. G. (1949) : "Evidence of a Space Factor at 11 + and earlier," *Brit. J. Psych., Stat. Sect.*, II, 3-16.
[3] THOMSON, GODFREY, H. (1940) : *What are Moray House Tests ?* (London : University Press).
[4] SCHONELL, FRED J., and SCHONELL, F. ELEANOR (1950) : *Diagnostic and Attainment Testing* (Edinburgh : Oliver and Boyd).
[5] THOMSON, GODFREY H. (1940) : *Op. cit.*
[6] SNEDECOR, GEORGE W. (1946) : *Statistical Methods* (fourth ed.). (Iowa : Iowa State Collegiate Press, 330-331.)
[7] *Ibid*, p. 151.

ACKNOWLEDGMENT

The writer wishes to thank Professor C. W. Valentine for valuable advice during the preparation of this paper for publication.

THE VALUE OF NOTE-TAKING DURING FILM LEARNING.*

By PHILIP ASH and BRUCE J. CARLTON
(*Inland Steel Company and The Pennsylvania State College*).

I.—Introduction.

During the typical classroom lecture, it is more or less expected that students will take notes of the important points made, and will use the notes for reviews. The competent lecturer frequently aids the students by repeating and emphasizing the important points, and by slowing up or pausing to permit the students to write notes without losing the thread of the lecture.

The typical instructional film is not usually designed to provide favourable conditions for note-taking. It has few, if any, of the pauses or repetitions likely to be made by a good face-to-face instructor. However, since in many other respects the lecture and film are comparable as teaching media, it seems worthwhile to investigate the extent to which note-taking during film showings might affect measured learning from films. The only published study related to this problem,[6] known to the writers, dealt with the contribution of note-taking to learning from a filmstrip on the subject of taking depth soundings with a lead line and sounding machine. In this study, by P. E. Vernon, the problem was not quite the same as the one in the present study since the rate of development of a filmstrip can be adjusted to permit the students to take notes without missing any new material which might appear on the screen. With these differences in mind it is still worthwhile to note that Vernon found that note-taking did not contribute significantly to learning.

II.—Experimental design and procedures.

Two hundred and sixteen students, comprising the freshman class of a small liberal arts college, participated in the study. The sample was divided at random into four approximately equal groups.

Three experimental methods were employed with each of two films, *High Altitude Flying* and *Ocean Survival and Safety*. The two films were sections taken from kinescope recordings of television training broadcasts to Navy midshipmen conducted at the Special Devices Centre.[4] Each was a black-and-white, sound film, about twenty minutes in length.

In the first method the students were simply shown the film, followed directly by administration of the film test (Film Only Method).

In the second method the students took notes while seeing the film. Immediately after the film was over, the notes were collected and the test was administered (Film plus Notes Method).

In the third method, the students took notes during the film showing, reviewed the notes for ten minutes after the showing, and then, after the notes were collected, took the test (Film plus Notes plus Review Method).

* The research on which this article is based was conducted under Contract N6onr-269, Task Order VII, with the Special Devices Center of the Office of Naval Research. This research was done while the senior author was on the staff of the Instructional Film Research Program, The Pennsylvania State College, U.S.A.

For each film, one group took the film test without having seen the film. This control group was used to determine what the students knew about the subject before receiving any instruction.

One group (A) served as the control for both films.

The second group (B) was given the Film Only Method for both films.

The third group (C) was given the Film plus Notes Method with *High Altitude Flying*, and the Film plus Notes plus Review Method with *Ocean Survival*.

The fourth group (D) was given the Film plus Notes plus Review Method with *High Altitude Flying*, and the Film plus Notes Method with *Ocean Survival*.

The methods were alternated in this manner for the groups to reduce the possibility that the superiority of one method over another might arise merely from a superiority of one group over another.

All the film groups saw the films in a dimly-lighted room, which had enough light to permit note-taking.

The tests covering the content of the films were of the multiple-choice objective type. The test on *High Altitude Flying* contained fifty-five questions; the test on *Ocean Survival* contained fifty-seven questions. The tests were administered during the same period as the film showing. No delayed recall tests were given.

III.—Results.

Before testing the relative effectiveness of different teaching methods, each method given to a different group, it is important to find out how comparable the groups are to begin with. The students in the four groups were compared with respect to measures of general intelligence, reading comprehension, and science aptitude. The tests included the Otis Gamma I.Q., the A.C.E. Psychological Examination, a test of Reading Comprehension, and the Co-operative Natural Science Test. It was found that the groups were entirely comparable on each of the four tests. The slight differences found may be ascribed to sampling error (see Table II in Appendix).

The results for the different treatments, for each film, are summarized in Table I, and are given in detail in Tables III and IV in the Appendix.

TABLE I

Average Percentage of Correct Answers on Film Tests.

Group	*High Altitude Flying*	*Ocean Survival and Safety*
No Film (Control Group) ...	33·5%	30·7%
Film and Notes	57·6%	59·1%
Film, Notes and Review	60·7%	63·0%
Film Only.....	61·8%	71·1%

First, *both films successfully taught the students*. For each of the three film groups, on the average about 60 per cent. of the items on each film test were answered correctly, while the students in the No Film Group answered only about 30 per cent. of the items correctly. Thus there was a large net gain in information.

Second, *for each film, the Film Only group earned the highest average (mean) per cent. score*. For the test on *High Altitude Flying*, students in the Film Only Group, answered 61·8 per cent. (34 out of 55) of the items correctly, students in the Film plus Notes plus Review group answered 60·7 per cent. of the items

correctly, and students in the Film plus Notes group answered only 57·6 per cent. of the items correctly. For *Ocean Survival* the percentages of correct answers were 71·1 per cent. for the Film Only group, 63·0 per cent. for the Film plus Notes plus Review group, and 59·1 per cent. for the Film plus Notes group.

Third, *the pattern of results applied to both films.* For *Ocean Survival and Safety* the differences in favour of the Film Method Only were statistically *highly significant.* Furthermore, the fact that the direction of results was consistent for both films gives us ground to be confident that *repetition of the experiment* with similar films and populations would confirm these findings about 999 times out of a 1,000. It should be noted that these results are limited to learning as measured by immediate tests since no delayed recall tests were given.

IV.—Discussion and conclusions.

The most reasonable inference from the data is that, with the films used, note-taking actually *interfered with* learning from the films. These films lacked the necessary pauses and repetitions for note-taking, and therefore, the attempt to take notes interfered with the students' efforts to learn from the films. Among other factors, this could be due to division of attention. Review of the notes apparently aided in reinforcing recall of the specific points written down, but did not compensate for interferences caused by taking notes.

These results are consistent with the findings of Jaspen,[1] Roshal,[3] and Kurtz, Brenner and Walter.[2] In three separate studies, these investigators found that the attempt to " participate " by some activity with a relatively *fast-moving film* actually resulted in a learning loss. Jaspen found *only with a slow-moving film* employing repetitions, and a leisurely rate of development, does a " participation " exercise facilitate learning.

The main practical implication of the present study is that when the instructional film is employed, the teacher should instruct his students to concentrate their attention on the film, try to " keep-up " with it, and avoid distractions from watching and listening to the film. However, Vander Meer[5] found that the provision of printed study guides which were studied by the students *before* and *after* the film showing, resulted in increased learning from films. Therefore, if it is believed to be desirable for students to have prepared notes for pre-film and post-film study, the provision of printed study guides might be considered.

V.—References.

[1] Jaspen, N. : "Effects on training of experimental film variables, Study II—' How-it works,' verbilization, participation, succinct treatment," *Technical Report SDC* 269-7-11 (The Instructional Film Research Program, The Pennsylvania State College, March, 1950).

[2] Kurtz, A. K., Walter, Jeanette S., and Brenner, H. R. : " The effect of inserted questions and statements on film learning," *Technical Report SDC* 269-7-16 (The Instructional Film Research Program, The Pennsylvania State College, September, 1950).

[3] Roshal, S. M. : " Effects of learner representation in film-mediated perceptual-motor learning," *Technical Report SDC* 269-7-5 (The Instructional Film Research Program, The Pennsylvania State College, December, 1950).

[4] Rock, R. T., Junr., Duva, J. S., and Murray, J. E. : " Training by television—the comparative effectiveness of instruction by television, television recordings, and conventional classroom procedures," *Human Engineering Project* 20-E-5a, *SDC Report* 476-02-2 (Special Devices Center, Port Washington, N.Y.).

[5] Vander Meer, A. W. : " Relative effectiveness of instruction by films exclusively, films plus study guides, and standard lecture methods," *Technical Report SDC* 269-7-13 (The Instructional Film Research Program, The Pennsylvania State College, July, 1950).

[6] Vernon, P. E. : " An experiment on the value of film and filmstrip in instruction of adults," *Brit. J. Educ. Psych.*, 1946, 16, pp. 149-162.

VI.—Summary.

1.—This experiment was conducted to discover the value of taking notes while viewing an instructional film. The study was performed by testing four groups of college freshmen to determine how well they mastered the content of two films under different conditions of note-taking.

2.—Two films were shown, in combination with each of three methods.

3.—In the first method, the students were simply shown the films, after which they took the test on the film content.

4.—In the second method, the students were instructed to take notes while watching the film. Immediately after the film was over, the notes were collected and the test was administered.

5.—In the third method, the students took notes during the film showing, reviewed the notes for ten minutes after the showing, and then, after the notes were collected, took the test.

6.—A fourth group (control) was given each film test without having seen the film to find out how much college freshmen knew about the subject of the films.

7.—Test data for 216 students showed the following results :

(*a*) Taking notes while watching the film resulted in reduced test scores.

(*b*) Review of the notes before taking the test resulted in slight gains over note-taking without review.

(*c*) The highest test scores were made by the group that watched the films *without taking notes.*

8.—The principal implication of this study is that taking notes while watching an instructional film of this type seems to interfere with learning from the film. Related studies have shown that only when the film develops very slowly, with pauses and repetitions, can students improve their learning by some participation exercise.

VII.—Appendix.

TABLE II

Means, Standard Deviations, for Four Matching Tests, and F-Ratios for Testing the Significance of Inter-Group Differences.

Test	A	B	C	D	Total Sample	F-Ratio*
Otis Gamma I.Q. :						
N	63	48	45	55	211	
Mean	114·3	116·2	114·4	116·3	115·3	<1
S.D.	9·2	9·5	9·7	9·1	9·4	
A.C.E. Psychological Examination:						
N	62	49	46	54	211	
Mean	57·1	63·1	60·1	58·4	59·5	<1
S.D.	27·5	26·4	26·3	26·5	26·8	
Reading Comprehension :						
N	62	49	46	54	211	
Mean	45·3	46·7	44·6	44·9	45·4	<1
S.D.	26·0	25·0	28·7	22·7	25·6	
Co-operative Natural Science Test :						
N	63	49	46	55	213	
Mean	58·9	58·6	61·0	61·6	60·0	<1
S.D.	24·5	25·1	24·1	23·0	24·2	

* For 200+ and 3 degrees of freedom, F·05=2·605. All the observed F-ratios were less than 1·0. Therefore, it may be concluded that there is no evidence that the four groups differ significantly on any of the four matching tests.

Note.—The number of cases is not constant for any group because one or more students failed to take each test.

TABLE III

MEANS, STANDARD DEVIATIONS, AND TEST RELIABILITIES FOR EACH FILM, BY TREATMENT.

Treatment	*High Altitude Flying*					*Ocean Survival*				
	Group	N	Mean	SD	r*	Group	N	Mean	SD	r*
Film Only	B	50	34·0	6·7	·79	B	50	40·5	5·6	·72
Film and Notes	C	48	31·7	6·2	·74	D	55	33·7	6·8	·77
Film Notes and Review	D	55	33·4	6·0	·72	C	47	35·9	6·5	·77
Total Experimental Group	B+C+D	153	33·1	6·4	·75	B+C+D	152	36·6	7·0	·79
Control	A	63	18·4	3·8	·28	A	63	17·5	3·7	·25

* Reliability based on Kuder-Richardson Formula 20. Based on 55 items in " High Altitude Flying " test, 57 items in " Ocean Survival " test.

TABLE IV

DIFFERENCES AND SIGNIFICANCE OF DIFFERENCES AMONG TREATMENTS.

	Higher Altitude Flying			*Ocean Survival*		
	Film Only	Film and Notes	Control	Film Only	Film and Notes	Control
Film Only	—	—	−15·6*	—	—	−23·0*
Film and Notes	+2·3	—	−13·3*	+6·8*	—	−16·2*
Film, Notes and Review	+0·6	−1·7	−15·0*	+4·6*	−2·2	−18·4*

* Significant beyond 0·1 per cent. level of confidence. All unmarked differences fail of significance at the 5 per cent. level or better.

NOTE.—The sign of the difference is determined by subtracting the mean for the group listed in the column at left from the mean for the group at the top of the column.

Footnote on "Practice Effects between Three Consecutive Tests of Intelligence"

By E. A. PEEL

Since the publication of my paper on the practice effect between three consecutive tests of intelligence which appeared in this *Journal* of November, 1952, Mr. W. G. Emmett has kindly informed me that the three tests used by the Derby authority in 1950/51, and referred to by me in Table II (page 197), were standardised on the Derby population. This means that any discussion of the differences between the three means is irrelevant to the problem of practice effect, for under such conditions of standardisation these effects are incorporated into the norms. The data, therefore, of Table II tell us nothing about practice effect. This criticism, of course, does not apply to the Grimsby data, which can be used without question for any discussion of practice effect.

Fortunately, I have been able to obtain practice effect data from two other authorities where the tests were standardised on outside areas. The first is a large urban area, and the tests are taken at an interval of four months. The results are given below in Table I:

TABLE I

	Girls n=479		Boys n=584	
	m	S.D.	m	S.D.
September, 1951	102·42	12·25	99·94	13·77
January, 1952 ..	105·94	12·59	103·32	14·09
Practice Effect ..	3·52	—	3·38	—

The second authority is a mixed urban and rural county, where two tests are taken at an interval of two months. The sample does not include some of the weaker children. Practice effect has been calculated in Table II for boys and girls together.

TABLE II

	n=705	
	m	S.D.
November, 1951	105·33	11·85
January, 1952	111·60	13·01
Practice Effect.....	6·27	—

These results, showing a practice effect of some 3.5 points of I.Q. over an interval of six months, and of some 6 points of I.Q. over an interval of two months, suggest that practice effects do not fall off very rapidly, if, indeed, at all. Both practice effects come well within the range of effects that I have obtained from populations tested over a monthly interval.

I am very much indebted to Mr. Emmett for calling my attention to the conditions of standardisation in Derby.

SUMMARIES OF RESEARCHES REPORTED IN DEGREE THESES [1]

An Experimental Study of Methods of Teaching English

By E. G. S. EVANS

(*Summary of thesis presented for the degree of Ph.D., Department of Research and Higher Degrees, University of Birmingham.*)

I.—Purpose.

The purpose of the study was to determine, experimentally, by means of covariance-analysis, the relative efficacy of three methods of teaching English in secondary modern schools. By ' efficacy ' was meant level of achievement in (*a*) the mechanical aspects of written English ; (*b*) written expression ; (*c*) reading ability ; and (*d*) general knowledge.

II.—The Teaching Methods.

The three experimental teaching methods were called ' Project,' ' Formal ' and ' Oral.' The Project method aimed to relate English to the interests and environments of the pupils through individual and co-operative projects and other activities, practical and social in nature. No formal lessons of any kind were taken, and corrective teaching was incidental to the project work. The formal approach, on the other hand, consisted of specific lessons, exercises and drills on the mechanical aspects of written English, on composition writing and on reading. Definite periods were set aside for corrective teaching and drills on common errors. The third method, the Oral approach, aimed to develop expression and correctness side by side, the one helping the other. Classwork consisted mainly of lecturettes, conversation groups, story-telling, oral compositions, play-acting, discussions, and other activites revolving around the spoken word. All these provided a basis for subsequent written work. In each of the three methods, the content of studies was controlled by the distribution of weekly lesson assignments to the teachers who participated in the experiment. The time factor was also controlled, 320-360 minutes being devoted to English lessons each week.

III.—Sources of Data.

The experiment was of six months' duration and took place in the boys' departments of six modern schools in the City of Birmingham. In each school, six intact classes and six teachers took part in the experiment. Three classes in each school were composed of boys aged 11.0—12.0 years, while three classes consisted of boys aged 12.0—13.0 years. Within each age-group, the pupils were classified into three streams or ability-groups, A, B and C, according to intellectual capacity and educational attainment. The data of the experiment were then derived from standardised tests of spelling, dictation, English usage, capitalisation, punctuation, word meaning, sentence structure, composition, reading (viz., word recognition and reading comprehension) and general knowledge which were administered uniformly to all pupils (N=1457) at the commencement and conclusion of the experimental period.

IV.—The Experimental Design and Method of Analysis.

The design of the experiment took the form of a rectangular arrangement consisting of three columns (ability groups) and twelve rows (schools and age-groups). In the allocation of the teaching methods, care was taken to ensure that the methods were equitably distributed within and between age-groups and ability-groups. This arrangement, which was particularly appropriate to the utilisation of intact classes, possessed the twin advantages of balance and randomisation, and

[1] These Outlines must be submitted through the Head of the Department in which the research was carried out.

permitted the extraction of differences ascribable to (*a*) methods; (*b*) schools; (*c*) age groups; (*d*) ability groups; and (*e*) error.

The teachers numbered thirty-six and were equally representative of (*a*) older, experienced teachers of 25-30 years' experience; (*b*) ex-servicemen who had been trained under the Emergency Scheme; and (*c*) younger men who had been normally trained. Wherever possible, the teachers were allowed a free choice of method according to their interests and teaching abilities. In general, the older men chose the Formal method while the emergency-trained men and the normally trained younger men selected the Project and Oral methods. Unfortunately, it was not possible to secure independent estimates of teacher-differences, and this constituted a serious limitation on the design of the experiment.

The covariance-technique was used as the method of analysis in order to reduce error, thereby increasing the precision of the comparisons. Separate analyses were computed for each of the several tests of English. Each analysis was based on the class means, classes within schools being made equal in size by the random extraction of cases. The technique then permitted estimates to be made of the components of heterogeneity which had been previously controlled by the design of the experiment, and, by the use of regression, enabled allowances to be made for differences in the initial mean achievement levels of the methods groups. The significance of differences remaining in these groups was then tested in the customary manner.

V.—Summary of Results.

(*a*) *The Mechanical Aspects of Written English.*—Analysis of the final results of the tests of capitalisation, punctuation and sentence structure indicated that the mean performance of classes exposed to the Formal method was significantly higher than that achieved by either the Project or Oral methods. It must be remembered, however, that the chief claim, which is usually advanced in favour of 'activity' or 'project' methods is not that they induce a high level of mechanical attainment, but that they contribute to the independence and emotional development of children. So far as the tests of spelling and English usage were concerned, the three methods were found to be equally efficacious.

(*b*) *Written Expression.*—Written expression was measured by means of four types of compositions: (i) simple reproduction of a story; (ii) narrative-descriptive; (iii) imaginative; and (iv) expository. Significant methods differences in favour of the Formal approach were secured in the narrative and imaginative essays. In the other two topics, the adjusted variances approached significance, but fell just short of the 5 per cent. point. The Formal method tended to be superior, and in this respect the findings were consistent with the results of the capitalisation, punctuation and sentence-structure tests.

(*c*) *Word Meaning and General Knowledge.*—The learning of the meaning of words and the acquisition of general information seemed to proceed best if teaching consisted mainly of activities revolving round the spoken word. Neither research projects nor formal exercises were as effective as lecturettes, class discussions and other oral activities as a means of increasing the pupils' meaning vocabularies and their level of general knowledge. Even so there was little direct evidence in this study of any transference of facility in word meaning to written English.

(*d*) *Reading Ability.*—At the beginning and end of the experiment, all classes were given both a word recognition test and a reading comprehension test. In the first-named test, the initial general mean of classes in the age-group 11·0—12·0 years was 10·4 years, stream means being 12·3 years (A), 10·1 years (B) and 8·9 years (C). In the age-group 12·0—13·0 years, the initial mean was 11·3 years, the mean for A, B and C streams amounting to 12·6 years, 11·5 years, and 9·9 years, respectively. In the final test, the class gains tended to be commensurate with increase in mental age. There was no significant difference ascribable to methods, due to the equitable distribution of gains between the methods groups. This also occurred in the reading comprehension tests, in which all classes, irrespective of methods, showed considerable improvement. Thus, in the age-group 11·0—12·0 years, the mean reading age of the pupils rose from 9·11 years to 12·9 years; with the older pupils, there was an increase from the initial mean of 10·5 years to a mean of 12·11 years.

An Investigation into the Values of the Film-Strip and the Educational Visit as Methods of Instruction to Secondary Modern School Pupils of 14-15 years.

By S. HELLIWELL

(*Summary of thesis submitted for the Degree of Master in Education at Manchester University*, 1952.)

The Problem.

The main purpose of the investigation was to discover the comparative effectiveness of three visual methods of teaching as means of giving factual knowledge. The three methods were :

(*a*) A film strip alone.
(*b*) An educational visit alone.
(*c*) Combined use of both visit and film-strip.

It was also desired to find out if there were any differences in results from different levels of (pupils') intelligence, from different types of teachers (' goodness of instruction '), from different types of schools (qualities of ' tone '). Moreover, the investigator attempted to discover whether the latter variables could effectively influence and alter the results in the three teaching methods under test.

The Topics.

Two were used to investigate the problem, namely, " A Dairy " and " A Newspaper Works." Copies of Common Ground film-strips, " Milk " and " How a Newspaper is Produced," were purchased, while the visits were made to a local newspaper works and a local dairy. The showing of the film-strips and the visits to the works were each of one hour's duration, the combined method, therefore, took two hours.

The Tests.

Each test required forty answers and consisted of various kinds of ' new type ' questions. The tests covered the whole field of the topic with emphasis on the main processes involved, and tested memory and comprehension. The tests were set exactly one week after the time of actual instruction. The dairy test showed a reliability coefficient between odd and even items of ·93, the newspaper works one of ·92, and both tests had the spread and discrimination necessary for a sound test. The whole of the papers were marked by one person only, the investigator himself.

Subjects.

The sample of school population was taken from a Lancashire industrial town. There were involved five schools, thirteen teachers and four-hundred and twenty-four pupils. All the pupils were of secondary modern school pupils aged 14–15 years. Within the limits of the type and age mentioned, there was the greatest possible diversity of teachers, schools and intelligence of pupils. The teachers and schools were classified as good, average and poor, while pupils were separated for intelligence into higher (I.Q. 95+), middle (I.Q. 85–94, inclusive), and lower (I.Q. below 85) levels.

Results.

The mean marks for the three teaching methods in the newspaper experiment were :

Film Method	14·63
Visit Method	19·74
Combined Method ..	25·30

Although all available test marks, intelligence quotients and other information about the newspaper experiment is available within the thesis, for the purposes of the present research work full statistical investigation was only carried out with the

results of the dairy experiment. The following table deals with the latter and shows the mean results for the three methods of teaching, the three levels of intelligence, the three types of teachers and the three types of schools.

The Dairy Experiment.		Maximum Mark=40	
The Variable		Mean Marks	
Methods	Film Strip 14·17	Visit ....17·29	Combined 20·58
Teacher Types	Poor ....15·74	Average 15·72	Good 20·66
School Types	Poor ....14·61	Average 17·03	Good ...19·63
Intelligence Levels ..	Lower ....12·43	Middle ...18·09	Higher....21·45

Again, it is seen that the combined method is best, the visit method second best and the film-strip poorest; moreover, very good results are also obtained for good teachers, good schools and from pupils of higher intelligence. It must be remembered that in the combined method teaching time was doubled. Analysis of variance was used to test the significance of the general differences in each of the above variables, and in all cases these differences were proved significant at the 1 per cent. level. When 't' tests were applied to individual differences between two means, with the exception of two cases, significance at the 1 per cent. level was proved again. The two exceptions were the difference between the average and poor schools (significant only at the 5 per cent. level), and the difference between average and poor teacher types (not significant even at the 5 per cent. level).

Investigating the influence of the other variables (e.g., intelligence) on the mean results of the three methods of teaching under test, a series of three analyses of covariance was conducted. These used the test marks with firstly the pupils' intelligence quotients, secondly teacher type marks and finally type of school marks as the initial marks influencing the test marks. The following table shows the resulting values of the method means after the influence of these other variables had been removed.

	Methods		
	Film Strip	Visit	Combined
Unadjusted Mean	14·17	17·29	20·58
Mean Adjusted for Intelligence	14·03	17·74	20·29
Mean Adjusted for Quality of Teaching ..	14·09	16·76	21·18
Mean Adjusted for Quality of School ...	14·17	16·73	21·14

In all cases F and 't' tests applied to the differences in the above means showed significance at the 1 per cent. level, and proved that despite any influence from the intelligence of the pupils, quality of school or teacher, the combined method was still best, the visit second best, and the film-strip poorest of the three.

To test interaction of methods with teacher types and methods with schools, all the individual test marks were first adjusted for intelligence, thus removing the influence of that variable from the results. Random selection was needed to obtain the required numbers of pupils from the total available ones to get proportional cells for each of the experiments. It was proved that interaction of methods with teacher types and methods with schools were both very strong and significant at the 1 per cent. level. When the interaction of methods X schools variance was used as the 'error' term to test difference in method means, these were still shown as significant to at least a level of 5 per cent. except for one difference—that between visit and film-strip methods. When the method means differences were tested against the interaction of methods X teacher types variance as the 'error' term, they all failed to satisfy even the 5 per cent. level of significance.

CONCLUSIONS.

1.—Good results are obtained from good teachers, good schools, higher levels of intelligence and the combined (film-strip plus visit) method of teaching, and statistical analyses proved these results to be sound.

2.—The combined method is best, the visit method second best, and the film-strip method poorest of the three. This is proved at the 1 per cent. level of significance in all cases, and in spite of any influence on the methods of the other variables, namely, teacher types, schools types or levels of intelligence, when acting alone.

3.—Nevertheless, the interaction influence of methods, with teacher types or schools is so strong that it is not always possible to guarantee the above order of effectiveness of the three teaching methods against the teaching habits, preferences or prejudices of particular teachers or schools, but it is only in regard to such interaction influences that this order of superiority of methods cannot be proved significant at the 1 per cent. level.

4.—There is reason to believe that ' out of school ' methods of instruction, such as the ' visit ' method in this account can compensate for poor quality of teaching, while ' visual aid ' methods are particularly suitable for the average type of pupil found in a secondary modern school.

The English Essay in Secondary Selection Examinations : A Comparison of Two Methods of Marking

BY H. LAMB

(*Summary of thesis presented for the degree of M.Ed., Manchester University.*)

The marking methods to be compared were :

(*a*) An " analytic-points " (AP) scheme used by individual markers based on a most comprehensive schedule of marking with credits and debits awarded in seven elements : Spelling, Punctuation, Handwriting, Syntax, Sentence Construction, Vocabulary, and Subject Matter.

(*b*) A " teamed-impressionistic " (TI) method in which marks awarded are the aggregated spontaneous impressions of a team of four markers.

A mark scale of 0–30 was used for both methods. Forty composition scripts, on one topic only, randomly selected from an actual selection examination, were marked twice by each method on two separate occasions, with intervals of four months, by a group of eight practising teachers. From these markings it was possible to obtain several sets of marks :

(*a*) Impression marks given by eight individual markers (I-I). Although not involved in the main comparison, these were analysed to afford a measure by which the success of the two main methods could be judged.

(*b*) Teamed marks provided by seventy teams made up of all the possible combinations of four markers selected from eight (TI).

(*c*) Analytic marks given by eight individual markers (AP).

(*d*), (*e*), (*f*) Re-markings of each of the above groups.

In addition, the marks awarded to the individual elements of the AP scheme were analysed separately for both markings. Questionnaires completed by the markers were analysed to study their attitudes to the two marking methods under review.

The success of an individual marker was judged less on his " compatibility " (the extent to which his marks agreed with those of his fellows) than upon his " consistency " (the extent to which his marks in one marking would agree with his own in a re-mark), but it was expected that a relationship would be established between the two measures. Both the coefficients were calculated by product-moment correlation methods supported by analysis of variance. The latter device was used also to establish reliabilities of the separate elements of the AP scheme

when the correlation devices would have proved impracticable by their very number or undesirable on account of the coarse mark scales.

For the three different methods of marking, the results from analysis of variance techniques were :

Method	Marking	Av. Marker Compatibility	Av. Marker Consistency
Individual Impression	First	·736	·861
	Re-mark ..	·735	
Analytic-Points	First	·861	·907
	Re-mark ...	·863	
Teamed Impression	First	·918	·961
	Re-mark ...	·917	

the compatibility coefficients for the TI marking being deduced only from the matching of teams with non-common members.

The comparative results for each of the seven elements of the AP method were :

Element	Marking	Compatibility Reliability	Consistency Reliability
Spelling	First	·910	·925
	Re-marking	·880	
Punctuation	First	·921	·935
	Re-marking .	·914	
Writing	First	·725	·763
	Re-marking .	·614	
Syntax	First	·509	·642
	Re-marking .	·555	
Construction	First	·645	·772
	Re-marking .	·755	
Vocabulary.....	First	·588	·695
	Re-marking .	·560	
Matter	First	·632	·710
	Re-marking .	·595	

An unexpected result revealed by the marks for separate elements was the range of standards adopted by individual markers. Thus, for example, for Writing (Re-mark) which had a maximum of two marks, the mean mark awarded ranged from ·563 to 1·763 and for Vocabulary (First marking) from 2·675 to 5·25 out of a maximum of eight. As, in the actual selection examination in the Authority using the scheme, absolute reliance had been placed in the self-contained nature of each element, it followed that a child fortunate enough to have his script marked by the most lenient marker in each element would, in the first marking, have a mark based on a mean of 12·9 and that a less fortunate child having his script marked by the most severe marker in each element would have his total based on a mean of 20·3.

The main conclusions drawn from this experiment were :

(1) By all criteria, the TI method proved superior to the AP method, and both were superior to the I-I method.

(2) As discriminating instruments all three retained the same order of effectiveness.

(3) All three methods returned results superior to those from previous investigations suggesting either or both of the possibilities that

(*a*) the sample essays used in the experiment were drawn from a greater range of ability than those in previous researches, or that

(*b*) the instructions both for marking by impression and for marking by points were more precise than those used in previous researches.

(4) Experience gained by markers within the experiment in handling the complicated marking schedule of the AP scheme led to no general improvement in the re-mark results over the first marking results, but experience gained by two markers in handling the schedule prior to the experiment may have helped them to produce high compatibility with others generally and with each other in particular, as well as high consistency within themselves.
(5) The most reliable elements of the marking scheme were Spelling and Punctuation. The highly objectivised approach to Syntax and Vocabulary, however, proved less reliable than the more impressionistic marking of Sentence Construction and Matter.
(6) The reliabilities for the separate elements of the AP scheme were so low as to suggest that its superiority over the I-I marks was largely the result of averaging.
(7) There was little in the experiment to suggest any relationship between a marker's compatibility and his consistency.
(8) Where the AP scheme continued to be used, it was essential that any one element should be marked in its entirety by the same marker.
(9) Though the AP method had the confidence of markers in its reliability, it was widely unpopular both on account of its complexity and also because its validity was doubted.

The Construction of a Test of Practical Ability with Special Reference to Woodwork

BY T. F. FITZPATRICK

(*Synopsis of thesis accepted for the M.Ed. Degree, Manchester University*, 1951.)

This study sought to investigate some of the factors involved in the learning of the basic skills of handicraft in the secondary modern school and to enquire into the value of group testing techniques to predict practical ability in woodwork among boys of eleven years.

Preliminary experiment was carried out on groups known to differ in woodwork ability in order to discover suitable tasks and techniques for group-tests. Scoreable questionnaires for the assessment of practical interest and home-craft equipment were also invented.

A final battery of tests was applied to 243 boys of 11 plus. The majority were children who were about to enter secondary modern schools, but forty were selected central school entrants. The boys came from ten primary schools varying in size and development, and situated in widely differing districts in the Manchester area. The tests were administered to the main group two months prior to the commencement of the organised woodwork course in secondary modern schools.

The battery consisted of the following tests :

(*a*) *Tests derived from factorial studies.*
(1) N.I.I.P. Group Test, 80 (modified introduction).
(2) Raven's Progressive Matrices.
(3) Moray House Verbal Intelligence Group Test 35.
(4) Bradford's Lattice-Ruler Drawing Test (with modified introduction).[1]

(*b*) *Dexterity and Psychomotor Tests of the job-sample type.*
(5) Paper cutting and arrangement.
(6) Wood cutting from a spill.
(7) Cube making from cardboard development.
(8) Sharpening a pencil.

[1] BRADFORD, E. J. G. : " Symposium on the Selection of Pupils for Different Types of Secondary Schools—An Experimenter's Point of View," *Brit. J. Educ. Psych.*, Vol, XVIII, Part II, June, 1948, pp. 67-86.

(9) Repetitive Knot-tying.
(10) Copying Knot patterns.
(11) Lino-cutting.
(12) Pin-pricking (Hand-eye co-ordination).
(13) Pencil tracing between lines (in form of a competitive race track).

(*c*) *Assessments of Interest and Background.*
(14) Interest Questionnaire.
(15) A Home Equipment Questionnaire (Pictorial).

Thorough preparation of the practical tasks ensured sustained interest within the groups during testing and the timing of some of the activities introduced a competitive element.

The scoring of the practical tasks was made as objective as possible and based on the agreed marking schedule of three judges. In the study some attention was paid to the validity of the scoring techniques.

During the first fifteen months of woodwork training, two independent estimates of craft ability were obtained from the craft teachers concerned. Estimates were obtained on a five-point scale and teachers were requested to rate each boy in relation to the ability of the " best " first-year boy attending their respective centres. This enabled a craft teacher to award a high or low grade with confidence and each teacher had experience of at least eighty other first-year boys. In addition, a practical woodwork test, involving the basic tool operations, was applied at the end of the fifteen months. Each tool operation was assessed by the teachers and an overall estimate of workmanship on this particular task was made. All estimates were given on a seven-point scale. These estimates were converted to standardised scores and the following inter-correlations were obtained :

THE INTER-CORRELATION OF MEASURES DERIVED FROM PRACTICAL WOODWORK TEST AND THE FIFTEEN MONTH GENERAL ESTIMATE

		1.	2.	3.	4.	5.	6.	7.
1.	Workmanship	—	·36	·57	·55	·56	·31	·59
2.	Planing	—	—	·34	·22	·30	·34	·22
3.	Sawing	—	—	—	·65	·76	·54	·48
4.	Sawing with grain	—	—	—	—	·71	·45	·40
5.	Paring	—	—	—	—	—	·61	·41
6.	Paring slope	—	—	—	—	—	—	·27
7.	15 Month Estimate	—	—	—	—	—	—	—

From these criterion measures the fifteen-month general estimate was accepted as the most important and regression weights were calculated on this variable. A compound criterion was derived which included the following : (i) the fifteen-month estimate ; (ii) sawing ; and (iii) workmanship.

Twenty-four variables were derived from the tests and sub-tests of the initial battery. The scores were converted to standard scores and correlated with the compound criterion scores. The following table shows the inter-relationship observed among selected variables employed in the final analysis.

THE INTER-CORRELATION OF THE INITIAL BATTERY VARIABLES AND THE COMPOUND CRITERION.

		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1.	Criterion	—	·30	·18	–·06	·17	·30	·26	·20	·18	·23	·21	·24	·11
2.	Space G.T.80	—	—	·41	·29	·37	·35	·31	·18	·40	·29	·31	·06	·35
3.	Matrices	—	—	—	·65	·64	·33	·23	·26	·36	·34	·28	·03	·19
4.	M.H. Verbal	—	—	—	—	·46	·27	·17	·05	·26	·23	·25	–·19	·19
5.	Drawing	—	—	—	—	—	·31	·32	·27	·43	·28	·23	·01	·25
6.	Cutting	—	—	—	—	—	—	·26	·17	·37	·42	·52	·20	·24
7.	Dexterity and Control.	—	—	—	—	—	—	—	·34	·19	·15	·14	·07	·20
8.	Copying Knots	—	—	—	—	—	—	—	—	·19	·14	·21	·11	·05
9.	Cube	—	—	—	—	—	—	—	—	—	·36	·17	·02	·30
10.	Lino	—	—	—	—	—	—	—	—	—	—	·30	–·00	·35
11.	Arrangement	—	—	—	—	—	—	—	—	—	—	—	·12	·11
12.	Interest	—	—	—	—	—	—	—	—	—	—	—	—	·12
13.	Equipment	—	—	—	—	—	—	—	—	—	—	—	—	—

The observed validities of each of the initial test variables with the compound criterion were each of low order. This is due, it is believed, to the nature of early craft-training estimates. The work-sample tests yielded higher validities than either of the general ability tests or Bradford's Lattice-Ruler Drawing Test. The Space test had a validity comparable in magnitude to that of the work-sample tests. The Interest Questionnaire proved most consistent and showed appreciable correlation with the criterion. It may be observed that it gave a negative correlation with the verbal intelligence test. This appears to be in agreement with results reported in this Journal by Peel.[1]

The unweighted multiple r for the selected variables listed above was ·35 and weighted multiple r was ·497. From the point of view of prediction the variables employed are of little value, but generally speaking the tests within the initial battery showed consistency with the functions they purported to measure, and some important inter-relationships may be observed.

GENERAL CONCLUSION.

Suitable motor performance tests can be devised for group administration to children of eleven plus, and may be used in conjunction with the well-known paper and pencil tests, provided modification is made in the mode of administration. Suitable techniques may be made available for the assessment of interest in practical activity and the quality of home equipment. With reference to this study, it was evident that class-teacher assessments of woodwork ability, in the early stages of training, emphasise differences in motor ability rather than general ability. Thus, in devising testing techniques to show differences in craftwork skill during basic training, attention should be paid to ability to see space relationships, ability to accomplish simple motor tasks of the work-sample type quickly, general ability, and especially to the child's present interest in practical activity.

[1] PEEL, E. A.: "Assessment of Interest in Practical Topics," *Brit. J. Educ. Psych.*, Vol. XVIII, Pt. I, Feb., 1948, pp. 41-47.

The Relation Between Entrance Examination Results and Subsequent Achievement in a Junior Art School, with an Analysis of the Abilities Involved

BY R. PITTS

(*Summary of thesis presented in part fulfilment of the requirements for the degree of Master of Education in the University of Manchester.*)

The purpose of the investigation was to study the problem of assessment and prediction in the work of a junior school of art, with 14–16 years of age. Attempts were also made to analyse the abilities involved in the course and to estimate the effects of the markers on the grouping of the art subjects and subsequent achievement of the children. Subsidiary questions dealing with the relationship of art and academic work to intelligence, and the difference in performance between boys and girls, were also considered.

MATERIAL.

Data were obtained from a junior school of art and these were supported by data from other such schools in various parts of the country. These data included: (*a*) Complete entrance examination* results for the years 1945-1949, in English, arithmetic, pattern, imaginative and observation drawing, an interview, intelligence

* The entrance examination was based on the recommendations of the Yorkshire Council for Further Education. These are outlined in a pamphlet published in 1946: "The Selection of Candidates for Admission to Courses in Secondary Art Schools and Junior Full-time Art Courses."

and colour tests and an assessment of work submitted from the candidates' previous schools; and (*b*) subsequent terminal and sessional results at the end of the first and second year of the two-year course involving English, arithmetic, geography, history, object drawing (i) of objects and (ii) of plants and figures, pattern drawing, research, free composition (first year), and vocational work (second year).

TECHNIQUE.

As the main problem was to measure the effectiveness of the entrance examination as an instrument of selection and prediction the problem of selecting a criterion arose, and then of relating this to the entrance examination. At least two possibilities presented themselves: (*a*) the sum total of the assessments in the art subjects at the end of the second year (omitting the academic subjects as the school is primarily an art school), or, (*b*) to divide the art subjects in some way to cover different abilities or aspects of the art course. Instead of basing this division on opinion or *a priori* evidence, it was decided to use factor analysis to reveal groupings in the art subjects which would serve as criteria, and, at the same time perhaps reveal the underlying structure of the abilities involved in pursuing the art course. The marks obtained from the school were for a variety of subjects, which ostensibly covered different aspects of art. These were given different names and the problem arose whether the activites covered by the names were merely functions of the markers and did not, therefore, represent specific and defined aspects of artistic ability.

PROCEDURE.

The factor analyses for the purpose of establishing a criterion, were carried out in two stages: (*a*) pilot analyses of the sessional results of the first year forms A and B in 1947 and 1948, and (*b*) analyses of the second year sessional results for the years 1947, 1948 and 1949 in the light of the first year analyses. In each case the subject marks were inter-correlated (first including and then omitting English, arithmetic and the intelligence test), and the resulting matrix analysed by using the Thurstone centroid method of multi-factor analysis. The results of the second year analyses followed the pattern suggested by the first year analyses, and the summary of the second year loadings in the bi-polar factors after rotation is given below:

SUMMARY OF LOADINGS

(Second Year Marks. Academic subjects omitted.)

Subjects	1947		1948		1949	
	I	II	I	II	I	II
Object Drawing (Objects)	·23	·83	·16	·91	·23	·89
(Plant and Fig.)	·24	·83	·36	·75	·11	·93
Pattern	·77	·49	·56	·56	·61	·69
Research	·64	·51	·92	·13	·68	·39
Vocational Work	·67	·30	·69	·21	—	—
Lettering	·85	·24	·47	·54	·74	·11

Two criteria were suggested by this table of loadings. There was a division into object drawing, objects and plant and figure (high loadings in factor II), and research, lettering and vocational work (high loadings in factor I). Pattern was omitted from the bi-polar criteria as its loadings were equal in both factors. These two criteria correlated 0·48 over the whole sample. A third criterion was taken, the 'total sum' of the art marks.

The subjects composing the three criteria were finally as follows:

Criterion "A": Vocational work, research and lettering.
"B": Object drawing, objects and plant and figure.
"C": Vocational work, research, lettering, object drawing and pattern.

ENTRANCE EXAMINATIONS AND THE CRITERIA.

The criteria were then related to the entrance examinations. Examination marks were taken for the years 1945 to 1947, and each set of marks was intercorrelated and correlated with the three criteria in turn. The table below shows the correlations obtained :

MEAN CORRELATION OF CRITERIA A, B and C WITH THE 1945, 1946 AND 1947 ENTRANCE EXAMINATIONS.

Subjects	Sub. Wk.	Arith.	Eng.	Mem. and Imag.	Obsn. drg.	Patt.	Intw.	Criteria		
								A	B	C
Sub. Wk.								·110	·298	·192
Arithmetic	−·054							·143	·104	·183
English	·220	·391						·153	·215	·143
Mem. and Imag.	·120	−·038	·098					·174	·355	·243
Observ. drg. ...	·255	·063	·200	·333				·138	·433	·415
Pattern	·245	·107	·145	·198	·203			·215	·184	·193
Interview	·431	·105	·250	·125	·284	·468		·143	·277	·164
Intelligence ...	·103	·291	·477	·140	·267	·047	·141	·134	·160	·215

Using Aitken's method of pivotal condensation, regression coefficients and multiple correlations were calculated.

AVERAGE REGRESSION COEFFICIENTS.

Criterion	Sub. Wk.	Arith.	Eng.	Mem. and Imag.	Obsn. drg.	Patt.	Intw.	Intce.	Rm
A	·062	·161	·110	·318	−·005	·277	−·111	·018	·517
B	·150	·071	·098	·119	·278	−·064	·025	−·001	·642
C	·056	·163	·058	·107	·376	·155	−·112	·019	·547

The value of the examination subjects as individual predictors and as members of a team of tests were considered separately. Regarded as a team of tests their relative merits can be judged by the regression coefficients and multiple correlations with the criteria. The subject weighting on the whole was low and there was no consistent level over the years. The average multiple correlation (0·642) showed that Criterion B gave the best prediction. An estimate of the individual value of each examination subject was obtained by squaring the correlations with the criteria. On this basis the best individual predictors were :

Criterion A	Criterion B	Criterion C
Pattern Memory and Imaginative drawing	Observation drawing Memory and Imaginative drawing	Observation drawing Memory and Imaginative drawing

RELATION OF INDIVIDUAL CHILDREN TO THE CRITERIA.

After the general consideration of the criteria in relation to the entrance examination, the position of certain children in regard to the three criteria, particularly A and B, was then examined. This was done in two ways : (*a*) by grouping the top and bottom three children on the basis of the criteria and then seeing if the

same, or different, children came top and bottom, and (*b*) by selecting children who were fairly well above the average on one criterion and correspondingly below the average on the other, and then making a comparison with an independent assessment from the school. The result, in both cases, showed that it was difficult to fit the children into the pattern suggested by the criteria. Whether there are two criteria representing entirely different aspects of the art course is not definitely confirmed or otherwise by the consideration of pupils in relation to the criteria.

The reason for the lack of any clear-cut distinctions when individual children's scores are scrutinised is evident from the results of factor analyses. The analyses show a bi-polar factor beyond the first (general factor), but the percentage variance accounted for by this bi-polar factor is small compared with that accounted for by the general factor.

Year	% Variance			
	First Factor		Second Factor	
	Common Variance	Total Variance	Common Variance	Total Variance
1947	76·9	51·6	9·9	6·7
1948	70·5	51·5	17·9	13·1
1949	82·1	60·3	19·8	14·6
Average	76·5	54·5	15·8	11·5

Over the three years the first factor accounts for 76·5 per cent. of the common variance and 54·5 per cent. of the total variance ; whereas the second factor accounts for 15·8 per cent. and 11·5 per cent., respectively. Therefore, individual scores are unlikely to be greatly affected by the separation into two criteria. Differences in correlations can be accounted for by the fact that small differences in scores over the whole list make noticeable differences in the correlations and make possible the extraction of factors beyond the general factor.

The Educational Guidance of School Children with Defective Hearing.

By PETER GASKILL

(*Summary of thesis submitted in part fulfilment of the requirements for the Degree of Master of Education at Manchester University,* 1952.)

In order to improve methods of educational guidance for children handicapped by impairment of hearing, an extensive survey was carried out, using especially selected tests of mental abilities and educational achievement.

METHOD.

The principal tests used were : The Wechsler Performance Scale (Form 1), a battery of five sub-tests, hitherto untried with deaf children in the British Isles ; the Raven's Progressive Matrices (1938) ; and the N.I.I.P. Group Test 70/1. For deaf pupils of secondary grammar school status, the Otis Beta and Gamma Tests were also administered and correlated with the results of the Wechsler Bellevue Performance and Verbal Scales.

Tests selected for measuring educational achievement included :

(*a*) The Schonell Essential Mechanical Arithmetic—Form A.
(*b*) The Burt and Schonell Graded Mechanical Reading Tests.
(*c*) The Gates Vocabulary Silent Reading Test.

Pure-tone audiometric and speech tests of hearing were also administered.

SUBJECTS.

Three central inter-related studies were made :

(*a*) In the first study, investigations were carried out in six residential schools for deaf children, three representing the pre-war system of classification, including both deaf and partially deaf children in the same school, a fourth school providing for severely deaf Grade III pupils with no naturally acquired speech, and a fifth providing for the needs of partially deaf pupils only. The sixth school is the only grammar school for severely and partially deaf pupils in the British Isles, the pupils being selected by written and oral examinations. 565 children (age range 10 to 18 years) were tested in these schools.

(*b*) The second study dealt with the most effective methods of clinical diagnosis and educational guidance for problem cases especially referred to the Department of Education of the Deaf, Manchester University. The positive contribution of this service to school medical officers, otologists, public health authorities, teachers and parents was assessed and an analysis made of 322 children (age range 5 to 15 years), referred from various parts of the British Isles.

(*c*) In the third study, ninety-three children, suspected of deafness following tuberculosis meningitis, were tested and their educational needs assessed.

RESULTS.

(1) According to the Wechsler Performance Scale the mean I.Q. of 465 children tested in schools for the deaf and partially deaf was 96·7 with a standard deviation of 21·7. 14 per cent. were found to have I.Qs. below 70 and 22·8 per cent. above 110.

(2) A further study was made to relate the Wechsler I.Qs. to age of onset and degree of deafness. The decibel readings were an average taken at 500, 1,000 and 2,000 c.p.s. in the better ear.

MEAN WECHSLER I.Qs.

Degree of Deafness	Born Deaf	Age of Onset		Mean of Rows
		1 to 4 years	4 years and over	
Above 80 dbs. ..	97·0	96·7	102·6	97·0
60 to 80 dbs.	100·1	99·5	98·9	99·0
Below 60 dbs. ..	92·3	93·6	89·7	91·9
Mean of columns	97·0	97·1	98·7	—

No significant difference was found between the means of congenitally and adventitiously deaf children, but pupils with partial deafness below 60 decibels in the sample tested, tended to be below average. It was found that very many of these children had been transferred to schools for the partially deaf because of educational failure in ordinary schools—ascertainment by screening tests of hearing was infrequent.

(3) The Wechsler Performance Scale, when correlated with other non-verbal tests of intelligence, gave the following correlations :

Wechsler Performance and Progressive Matrices " r "= ·64 ± ·057

" " " Group Test 70/1 " r "= ·72 ± ·032

Progressive Matrices and Group Test 70/1 " r "= ·52 ± ·049

An examination of results for 350 senior deaf pupils using the Progressive Matrices demonstrated that whilst high scores showed reasonable validity, low scores when checked with other data, including teachers' estimates, were frequently unreliable. 75 per cent. failed to reach the median percentile norm for their age group. The re-test reliability coefficient of the Wechsler Performance Scale for 50 children age 13½ years was ·89 S.E. m 4·82.

(4) In a preliminary survey of educational achievement, 156 deaf children, average age 12 years 11 months, were over four years behind the norms for hearing children in silent reading vocabulary, and over three years retarded in mechanical arithmetic.

(5) The Mary Hare Grammar School for the Deaf : The Wechsler Performance Scale showed no significant differences in the Mean I.Qs. for any particular category of deaf child at this level. Although adventitiously deaf and partially deaf pupils are considerably more successful in the School Certificate examination, Grade III deaf pupils make commendable progress considering their language handicap on admission. For sixty-five grammar school pupils, the scores on the Otis Mental Ability Tests approximated to those of an unselected group of ordinary children. Results of tests were as follows :

Group Tested	The Wechsler Performance Scale		
	Mean I.Q.	S.D.	No.
1. Pupils on School Roll, March, 1949	117·2	12·0	48
2. 1949 Entrance Candidates	117·0	12·3	20
3. 1950 Entrance Candidates	116·5	10·5	15
		Total	83

Mean Wechsler Performance I.Q. for 43 Grade IIB pupils was 115·6 and 117·8 for 40 Grade III pupils.

Group Tested	Otis Mental Ability Scale		
	Mean I.Q.	S.D.	No.
Pupils on School Roll, March, 1950	97·6	15·8	65

The Mean Otis I.Q. for 33 Grade IIB pupils was 107 and 90 for 32 Grade III pupils.

It was also noted that differences between assessments by performance and verbal tests of intelligence declined as reading levels rose.

(6) Clinical Cases.—An examination of 322 children referred from ordinary schools for tests of hearing and educational achievement, revealed a marked retardation in oral language and reading comprehension among children with defective hearing. 75 per cent. were retarded both in oral language and mechanical reading vocabulary. 39 per cent. were non-readers, 24 per cent. retarded by two or more years and 12 per cent. retarded by at least one year. A follow up of Grade IIA children in ordinary schools suggested the need for more effective measures to ensure full aural habilitation.

(7) T.B. Meningitis Children.—A study of children with defective hearing following tuberculosis meningitis revealed a marked degree of hearing loss in most cases (with a tendency for the higher frequencies of the speech range to be affected first), a normal range of mental ability and a reading retardation commensurate with the time spent in hospital. For twenty-five senior children (10 to 15 years) the Wechsler Performance Scale gave a mean I.Q. of 96, S.D. 18·6. The Progressive Matrices gave a mean I.Q. of 89, S.D. 14·9. A performance scale sampling various facets of intelligent behaviour such as the Wechsler Mental Ability Scale, was found to be the most satisfactory instrument used in the clinical diagnosis of these cases.

BIBLIOGRAPHY

DAVIS, H. (Edit.) : *Hearing and Deafness* (London, Staples, 1947).
DAY, H. E., FUSFELD and PINTNER, R. : *A Survey of American Schools for the Deaf* (Washington D.C., National Research Council, 1928, Ch. XIV.
DESAI, MAHESH : " The Test—Retest Reliability of the Progressive Matrices Test," *Brit. J. Med. Psych.*, 25, 1952, pp. 48-53.
EWING, I. R., and A. W. G. : *Opportunity and the Deaf Child* (London, Univ. Press, 1947).
GLORIG, A., and FOWLER, E. P. : *Tests for Labyrinthine Dysfunction Following Streptomycin Therapy* (Chicago, Trans. Amer. Otol. Soc., 1947, pp. 66-87).
GOODMAN, A. I. : " Residual Capacity to Hear of Pupils in Schools for the Deaf," *J. Laryn. and Otol.*, LXIII, 10 Oct., 1949.
HOOD, H. B. : " A Preliminary Survey of Some Mental Abilities of Deaf Children," *Brit. J. Educ. Psych.*, 1949, 29, iii, pp. 210-219.
PINTNER, R., EISENSON, J., and STANTON, M. : *The Psychology of the Physically Handicapped* (New York, Crofts, 1941).
SLATER, P. : " Tests for Selecting Secondary and Technical School Children," *Occup. Psych.*, 1941, 15, No. 1, pp. 10-25.
WATSON, T. J. : " Facts and Figures," *Teacher of the Deaf*, Vol. XLVII, No. 279, 1949, p. 91.
WECHSLER, D. : *Measurement of Adult Intelligence* (Baltimore, Williams and Wilkins Co., 3rd editn., 1944).

Acknowledgments are gratefully made to the Medical Research Council, for the grant which has made this research possible.

BOOK REVIEWS

Human Nature—Its Variations, Development and Assessment: JOHN C. RAVEN. (H. K. Lewis and Co., Ltd., pp. xii+226, 12s. 6d.)

Mr. Raven intends this book to be " a concise psychology for those concerned with the welfare of others." It falls into three parts. The first—" The Development of Behaviour "—is " the outcome of lectures given each year to student nurses at the Crichton Royal " ; and it deals with The Subject Matter of Psychology, Childhood, Adolescence, and Maturity. Part Two—" Variations in Experience "—forms part of " the subject matter of a more advanced course of lectures given to third year nurses and medical students." It consists of two chapters, one on " Well Being and Dis-Ease " and a long chapter called " Introspective and Social Psychology," in which various topics are touched on—as, for instance, " Voluntary Action," " Dreaming," " Personality," " Projection," " Feelings of Affection and Emotion," " The Need for Companionship," and " Sympathy." Part Three—" Assessing Abilities and Interests "—embodies " lectures given to post-graduate nurses, sisters or tutors and from time to time doctors, teachers and others interested in psychological tests and their uses." It consists of two chapters—one on the history of mental testing, the other on the uses and limitations of mental tests. The book has a preamble on the biology of organic development, a short appendix describing statistical techniques used in psychology, and an index and glossary of fifty terms.

Parts I and II are discoursive and general in character, and are interlarded with a number of technical terms that frighten me. In contrast, Part III is well-knit, precise and to the point.

How helpful is this book likely to be to student nurses and the like ? As I have never had the experience of teaching people of this sort, I hesitate to say. I suspect, however, that it will not be of much assistance, for I doubt whether it adopts the right way of pressing psychology into the service of " those concerned with the welfare of others." Surely, what student nurses, *et al.* require is (i) to be sensitized to the psychological issues they will meet in the course of their professional duties, and (ii) to learn to appreciate the merits and demerits of alternative ways of dealing with these issues. There happen to be two such issues in the news at present: (*a*) Should parents be allowed to visit their children in hospital ? And if so, how often? (*b*) Is there an Iron Curtain in the ward between patients on the one hand, and doctors, sisters and nurses on the other ? And, if there is, what should we do about it ? Those with experience of hospitals and similar institutions will be able quite easily to list many other questions of this sort. Raven's book seems to have little bearing on these questions. But, surely it is advisable to make students aware of these sorts of issues and of the merits and demerits of alternative policies in regard to them. In teaching students in this way, one would perforce have to make use of psychological discoveries, hypotheses and theories all the time. Moreover, in so doing, one would have to bring in many themes that Raven barely mentions—if at all. For example, the different sorts of people one runs into in hospital—in bed or out of it ; the various reactions to frustrations, by children and adults, and the significance of typical symptoms ; the various defences that people adopt in unfamiliar and frightening environments; the symptoms and sources of anxiety and the worth of alternative techniques of coping with it ; the rough correspondences that can be pointed out between various personality differences among normals and the particular abnormalities they are each likely to display under stress ; the satisfactions, both healthy and morbid, that nurses and doctors can derive from the practice of their profession ; and, of course, the whole topic of interpersonal relations in small groups and communities. Naturally enough, the particular issues that are pressing in one sort of hospital, for example, a mental hospital, may differ from those that are pressing in another sort ; and the particular form these issues take will vary from one institution to another.

This, then, seems to me—ignorant bystander that I am—to be a more hopeful way of making psychology available to student nurses, *et al.*, than the approach exhibited by Raven in this book. But, no doubt, he has good reasons for doing what he has done—reasons of which I know nothing. B.A.F.

This Matter of Mind: B. H. KIRMAN. (C. A. Watts and Co., Ltd., pp. 94, 1s.)

This book claims to present "without any sacrifice of scientific precision" an account of psychology as a practical science. One of its chief aims, we are told, is to "expose the fallacies underlying so called intelligence tests," and to show the errors into which "academic psychologists" are led when they attempt to substitute experimental or statistical procedures for the experience and knowledge of the medical specialist. "Test psychology," says Dr. Kirman, "is still dominated and overshadowed by the highly mathematical and highly speculative work of Pearson: this worker, using results obtained in an effort to measure various human abilities, deduced that all these had factors in common; this common factor he called '*g*'." Worse still, his followers, among whom Burt is singled out as the arch-offender, try to "demonstrate on page after page covered with algebraic formulae, that *g* has an independent existence—a little god, who lies concealed in a man's brain and determines his fate." As a result, we are told, "the influence of the social environment is ignored"; and "a testee of working class origin may be confined to a mental deficiency insitution, no matter what his latent potentialities."

Dr. Kirman is an able writer, who has himself published researches on mental diseases in various medical journals. He is Deputy Superintendent of one of the best known Mental Hospitals for Children, and is fully abreast of modern work in his own particular field. Teachers and educationists, therefore, may readily be tempted to accept his statements as authoritative. Hence, it is necessary to warn them that the views he ascribes to Pearson, Burt, and other "academic writers" are almost the exact opposite of what they actually wrote.

So long as he is discussing problems that legitimately fall within the province of the physician, what Dr. Kirman says is excellent. But, when he attempts to describe and criticize the methods and results of normal psychology, he provides a striking illustration of the errors that the psychiatrist is apt to make when he trespasses beyond his own particular sphere.

Personality and Conflict in Jamaica: MADELINE KERR. (Liverpool Univ. Press, pp. 217, 15s.)

This interesting and pleasantly illustrated volume is the result of the author's two years spent in Jamaica through the assistance of The Colonial Social Science Research Council. Miss Kerr evidently got on friendly terms with varied types of people and she gives detailed records of many reports and many of her own observations, including those on family relationships, and on the work and play of children. She also applied personality tests.

One dominant factor in personality development, Miss Kerr suggests, is the conflict of the native and Anglo-American cultures, and she gives numerous illustrations as to how this arises. But her interpretations of some of her observations suggest the reading into them of theories of her own. Sometimes, indeed, she gives facts which seem to refute her own theories. For example, she stresses the lack of opportunity for phantasy and creative expression and use of imagination in the play of children; yet limited as they are as regards man-made toys, Miss Kerr herself describes excellent examples of phantasy play, and gives no evidence that the children lose anything through not having paints or sand to play with. Again, the boys are said not to make successful mechanics through lack of opportunity to manipulate material manually, or to use their fingers in skilled operations. Yet, we are told they make catapults and shoot birds, and make their own cricket bats and carve their tops out of cocoanut.

Because one little girl put a picture of a horse between her thighs and pretended to ride it, masturbation was suspected! But where *would* the horse be if she were riding? Such 'phantasy' in a social psychologist greatly reduces the value of her interpretations. Nevertheless the plain record of many facts, and the ideas expressed by the people, make the book a useful report on an interesting people.

The Psychology of Human Learning: JOHN A. MCGEOCH and ARTHUR L. IRION. (Longmans, Green and Co., pp. 581, 35s.)

This is the second edition of a book by the first named author which has been revised by Dr. Irion, with the addition of a considerable amount of new material. The result is a very extensive survey of work on the topic named. Some idea of this will be gained from the fact that there are about 800 names in the Author Index. Apart from very early work the authors quoted are almost entirely American, and it is interesting to notice that results which are reported as having been discovered in 1938, were well-known in this country at least as early as 1914.

The book will be extremely useful to the more advanced student as a reference for detailed investigations. The discussion of the results, however, is not always so valuable as the outline of facts, and sometimes, indeed, it is not quite clear whether the investigations or comments referred to animals or upon human beings. The style of the writing and the fondness for technical terms sometimes make the reading heavy going. C.W.V.

The Background of Music: H. LOWERY. (Hutchinson's University Library, pp. 200, 8s. 6d.)

The outstanding quality of this book is the wide range of topics dealt with, all in connection with the psychology of musical ability and appreciation. It deals first with the physical basis of sound in general and musical notes in particular. Here various musical instruments (including the human voice) come into consideration. There follows a more physiological chapter on the ear and hearing; then more definitely psychological chapters on musical abilities and the testing of them, on aesthetics, on appreciation and on musical training.

Within the compass of two hundred pages, this is a wide range of topics; and necessarily some of the psychological topics are not very thoroughly discussed, and some important researches not referred to. But substantially, Dr. Lowery is very sound, and the book can be strongly recommended to students of the psychology of music, and in particular, to those preparing to teach music or lecturing to students on the teaching of music. C.W.V.

Pavlov: A Biography: B. P. BABKIN. (Victor Gollancz, Ltd., pp. 333, 25s.)

This is an extremely interesting study by one who knew Pavlov intimately and worked with him for many years. Nearly half the book is devoted to a biography of Pavlov—his methods, personal qualities, political views and so on. Two other sections expound much of his earlier work in physiology, which is not so familiar to English students as his work on Conditioned Reflexes, which is discussed in the last section. When the writer wanders into psychological topics his level falls, as does that of Pavlov himself. We read again of the need to 'cherish' the 'reflex of purpose'!

An Introduction to Industrial Psychology: MAY SMITH, O.B.E., M.A., D.SC. (Cassell and Co., Ltd., 12s. 6d. net, pp. 295.)

This is a further revision of a book already reviewed in this *Journal*. It is not surprising that so compact and comprehensive a book, written in such a clear style, should have passed into a fifth edition within ten years.

OTHER PUBLICATIONS RECEIVED

The mention of a book in this list does not preclude a later review.

Contrast Psychology : MURDO MACKENZIE (Allen and Unwin, 21s., pp. 304).

An Introduction to Industrial Psychology : MAY SMITH, M.A., D.Sc. (Second edition, Cassell, 12s. 6d., pp. 295).

The Writing of Arabic Numerals : G. G. NEILL WRIGHT (Univ. of London Press, Ltd., 10s. 6d., pp. 424).

Child Psychology : GEORGE G. THOMPSON (Harrap and Co., 30s., pp. 667).

Social Psychology : SOLOMON E. ASCH (Prentice Hall, pp. 646).

A Further Study of Visual Perception : M. D. VERNON (Cambridge Univ. Press, 35s., pp. 289).

A Pre-School Record Form and Pamphlet : A. H. BOWLEY (E. and S. Livingstone, Form 1s., Pamphlet 1s. 6d.).

Twins : DOROTHY BURLINGHAM (Imago Pub. Co., 35s.).

Science News 17 : Edited by J. L. CRAMMER (Penguin-Harmondsworth, 1s. 6d., pp. 156).

Chronicle of the World Health Organization : Vol. 6, No. 12 (W.H.O. Pubs., 1s., pp. 11).

Studies in Selection Techniques for Admission to Grammar Schools : Univ. of Bristol Inst. of Educ. (Univ. of London Press, 2s. 6d., pp. 68).

Saving Children from Delinquency : D. H. STOTT (Univ. of London Press, 12s. 6d., pp. 266).

L'Attention et Ses Maladies : ALEXANDRE BAL (Presses Univ. de France, pp. 123).

The Education of the Young Worker: Oxford Univ. Depart. of Educ. (Heinemann, 3s. 6d., pp. 73).

Primary Love and Psycho-Analytic Technique : M. BALINT (Hogarth Press and Inst. of Psycho-Analysis, 30s., pp. 288).

Benjamin Britten : Edit. by D. MITCHELL and H. KELLER (Rockliff Pub. Corp., 30s., pp. 410).

Leighton Park : S. W. BROWN (Leighton Park School, Reading, 15s. 10d., pp. 198).

School and Psychology: John Elmgren. A Report on the Research Work of the 1946 School Commission (Sweden). Pp. 340.

The Psychology of Learning : JAMES DEESE (McGraw-Hill, 47s., pp. 398).

Admission of Youth to Advanced Vocational Schools, etc., and *Youth and Leisure* : Reports on these with English Summary (Danish Government Youth Commission).

Maladjusted Youth : Report with English Summary (Danish Government Youth Commission).

The Teaching of Geography in Secondary Schools : Issued by the Incorp. Assoc. of Assistant Masters in Secondary Schools (Philip and Son, 17s. 6d., pp. 509).

Straight and Crooked Thinking : R. H. THOULESS (Pan Books, 2s. pp. 187).

La Sensation : HENRI PIÉRON (Presses Univ. de France, pp. 135).

Méthodes de la Psychologie (Parts 1 and 2) : T. G. ANDREWS (Presses Univ. de France, 1,500 fr. each Vol., pp. 863).

L'Emotion, La Volonté et le Courage : EDGARD FORTI (Presses Univ. de France, 900 frs. pp. 259).

Researches and Studies : No. 7, Jan., 1953 (Univ. of Leeds Inst. of Educ., 3s. 6d., pp. 75).

School and Society in England : C. ANDERSON and M. SCHNAPER (Public Affairs Press, Washington D.C., pp. 34).

Understanding Stuttering : A. B. GOTTLOBER (Grune and Stratton, New York, $5.50, pp. 262).

Fantasy and Fun : Collected by Children aged 7 to 13 (Forbes Robertson, 12s. 6d. net, pp. 80).

Success in Psychotherapy : WOLFF and PRECKER (Grune and Stratton, New York, $4.75, pp. 190).

College and Life : M. E. BENNETT (McGraw-Hill, $4.50, pp. 396).

Mental Measurement : Univ. of Bristol Inst. of Educ. (Univ. of London Press, 2s. net, pp. 30).

A Résumé of Work Done and Its Scope and Function : Government Central Pedagogical Inst., Allahabad.

Word-Making and Word-Taking : E. R. BOYCE (MacMillan).

A Study of Various Methods of Appraising Rate of Reading : Education Research Series No. 22 (Dept. of Educ. Research, Ontario College of Educ.).

Selection and Training of Shorthand Students in Ontario Secondary Schools : Research Series No. 23 (Pitman).

VOLUME XXIII. NOVEMBER, 1953 PART 3

SYMPOSIUM ON THE EFFECTS OF COACHING AND PRACTICE IN INTELLIGENCE TESTS*

I.—AN ANALYSIS OF SOME RECENT INVESTIGATIONS.

BY ALFRED YATES
(*Research Officer, National Foundation for Educational Research in England and Wales*).

I.—INTRODUCTION.

IN this paper I propose to give some account of the investigations that have been carried out by officers of the National Foundation for Educational Research into the effects on children's performance in group tests of intelligence that can be brought about by systematic coaching and by unassisted practice. These investigations, some of which have been fully reported elsewhere,[1] arose logically, we feel, out of the inquiries that we have for some time been pursuing into the methods employed by local education authorities for the allocation of primary school leavers to appropriate courses of secondary education. In most areas decisions concerning the educational future of eleven-year-old children are based predominantly on scores derived from objective tests of ability and attainment. It seemed to us, therefore, that a necessary feature of our inquiry must be an attempted analysis of the test situation with a view to identifying the influences that combine to determine a child's level of performance and to estimating the degree to which each variable affects the final result. I have stressed the fact that we regarded our coaching experiments as an integral part of our examination of selection methods because this may, in part, explain why some of the inferences that we feel justified in drawing from the available evidence are at variance with those favoured by some other investigators, including Professor P. E. Vernon. As Dr. Watts has been at some pains to point out, we are concerned with the practical issue of what is likely to happen when eleven-year old children in the maintained schools of England and Wales are coached or practised in preparation for the kinds of tests that are nowadays employed by most education authorities. We are not, therefore, inclined to take into account the results of experiments in which a handful of American undergraduates are coached in the Army Alpha test, for example, or in which an investigator tries to find out how large a gain can be brought about in the performance of a home-made test by coaching some specially selected group. Such considerations are relevant no doubt if one is pursuing what some choose to call more 'fundamental' research.

* Articles in this Symposium will be based on papers contributed to the symposium on this subject held at the Annual Meeting of the British Psychological Society, at Nottingham, in April, 1953. Later contributors will include Dr. J. B. Dempster and Dr. S. Wiseman, and the Symposium will be concluded by Professor P. E. Vernon.

It would be impossible, within the limits of this paper, to give a full account of the experiments that we have conducted at the Foundation, and since some selection has to be made, I feel that it would best serve the purposes of this symposium if I were to concentrate on those aspects of our investigations about which some disagreement has been expressed. The main points at issue are the size of the gains that coaching can be expected to bring about, and the question of whether or not the official sanction and encouragement of coaching in all schools would serve the interests of fairness. I proposed to describe the evidence and to outline the arguments upon which my colleagues and myself base our conclusions concerning these two points.

II.—Size of coaching gains.

(i) *Some Pilot Investigations.*

The first of our researches was an exploratory investigation carried out by Dr. A. F. Watts, who arranged for a group of children to work ten complete Moray House examinations, each consisting of an intelligence test, an Arithmetic test and an English test. Between the examinations, which were held weekly, the children were coached by their teachers. The results are shown in the following table :

TABLE I

	Coached Group			Control Group			Difference in Gains
	Initial Tests	Final Tests	Gains	Initial Tests	Final Tests	Gains	
Intelligence	108·06	116·26	8·20	104·97	108·19	3·22	4·98
Arithmetic	94·03	106·14	12·11	102·22	106·09	3·87	8·24
English	98·29	107·91	9·62	97·28	101·19	3·91	5·71

It will be seen from the table above that the mean gain in intelligence test score resulting from this formidable combination of coaching and practice, was eight points of standardised score, compared with a mean gain of just over three points achieved by the children in a control group who pursued their normal school curriculum between the first and the final test. In reporting this experiment before a meeting of the British Psychological Society, in December, 1950, Dr. Watts referred to an experiment that I had conducted in Belfast during the previous year. In this experiment a group of children were coached for ten forty-five minutes periods and produced a gain of nine points ; the control group in this case obtained a gain of over five points. It should be noted that the test used in this experiment was the Otis Advanced examination which several investigators have shown to be more susceptible to the effects of coaching than, for instance, the Moray House series. A further experiment carried out by Dr. Watts and myself involved the children in the first year of a Middlesex secondary modern school, some of whom were coached for three hours, some for six hours and others for nine hours. The combined results showed a mean gain of 8½ points for the coached children and 6 points for the controls.

(ii) *A Large-scale Inquiry.*

Our main experiment was one in which twenty junior schools took part, the sample comprising over 1,200 children. Some of these children received coaching, others were given the opportunity of working six practice tests, and there were, of course, control groups of comparable age and range of ability.

TABLE II

Group	Mean Gain	Level of significance of difference between Gains.
3 hours coaching ..	5·1	P = ·001
Control	2·7	
6 hours coaching ..	4·1	P = ·05
Control	2·6	
9 hours coaching ..	5·5	P = ·001
Control	3·1	
Practice	6·0	P = ·001
Control	2·4	

From the above table it will be seen that the coached children made a mean gain of between five and six points, the children who enjoyed unassisted practice obtained a mean gain of six points, and the control group's score improved by about three points. Moray House tests were used throughout this experiment as the first and final tests, as practice tests, and also as coaching material.

(iii) *Comparison with other Investigations.*

These results considered in relation to those of other investigators (e.g., Dempster,[2] Wiseman,[3]) who have chosen for their experiments samples of children who can be regarded as reasonably representative of the general school population, and have employed Moray House or similar tests, have brought us to the conclusion that the mean gain to be expected of such a group of children as a result of a coaching lies between 5 and 9 points of standardised score. This, it will be recognised, is a humbler estimate than that which Professor Vernon[4] has formed and publicised (Professor Vernon suggests an average of 15 points rising to 18 points for unsophisticated children), and the marked difference between his conclusions and ours deserves some comment. As I suggested earlier, the difference may have arisen in part from the fact that we have had regard only to inquiries into the effects of coaching on the performance, in tests of the Moray House type, of eleven-year-old children in State-aided schools. Professor Vernon on the other hand, concerned perhaps with a wider issue, has quoted as relevant to his endeavours to arrive at an estimate of the probable effect of coaching, investigations involving adult subjects in America and elsewhere, experiments conducted in 1924 by an investigator who used a home-made test, and an inquiry carried out by one of his students, Dr. D. T. Navathe, who selected for his purposes a group of preparatory school children. The identity of the test he used in this experiment has not, as far as I am aware, been disclosed.*

* Since this paper was written, Professor Vernon has reported the discovery of an error in the analysis of the results of this experiment (*Times Ed. Supp.*, 24th April, 1953). The original finding was a mean gain for the coached children of 16 points. This has now been reduced to 11 points.

Professor Vernon prefers to ascribe the difference between our estimates and his to our neglect of the effects of ' test sophistication.' His argument is that most of the children who took part in our experiments had had some previous experience of intelligence tests and that this fact has tended to decrease the gains obtained. We have been unable to discover any evidence to support this contention. None of the children involved in our inquiries had had, as far as it could be ascertained, experience of tests for at least six months prior to the beginning of the experiments, and Professor Peel[5] has convincingly demonstrated that the effects of practice do not persist after an interval of this length. Professor Vernon himself has found,[4] moreover, that the effects of coaching disappear even more rapidly than those of practice. Furthermore, we had the opportunity of comparing the performance of groups of children who had some time previously received intensive coaching with others who were comparatively innocent of intelligence tests and our statistical advisers have assured us that they can detect no relationship between the degree of previous sophistication and the gains obtained in our experiments.

(iv) *Follow-up of Individual Cases.*

Further evidence in support of our more conservative estimate of the effects of coaching appear likely to emerge from a follow-up of our main inquiry—the one in which over 1,200 children from twenty primary schools took part. This was conducted in order to obtain further and more detailed information about some of those children whose gains or losses varied considerably from the average obtained by the group to which they belonged, and with a view to discovering the possible causes underlying their deviations. Those children whose gains in score were more than one standard deviation above or below the mean for the group to which they belonged (coached, practised, or control) were the subjects of the investigation.

For each child the scores obtained in two previous Moray House tests administered by the local education authority were recorded. For each child, therefore, the results of at least four tests were available :

(*a*) A test administered by the local education authority in September, 1951, as a practice test.
(*b*) A test administered by the local education authority in January, 1952, as part of the Common Entrance examination.
(*c*) The initial experimental test administered in June, 1952; and
(*d*) The final experimental test administered in July, 1952.

Visits were paid to the schools attended by the children and the teachers who knew them were invited to provide such information as they could about each child's school work and progress, temperament, personality, and home background.

The comments supplied by the teachers are, of course, subjective judgments and interpretations and are, therefore, liable to the errors known to be inherent in this form of assessment. We felt, however, that these comments, based, as they were, on an intimate knowledge of the children over a period of two or three years could provide valuable evidence particularly if certain precautions were observed. We tried, for instance, as far as possible to secure more than one opinion, often combining the views expressed by a child's teacher with those furnished by another member of the staff or by the head teacher, and paying particular regard to points of agreement. Furthermore, we refrained from admitting as trustworthy evidence all unsupported statements. For example, the description of a child as a ' fluctuator,' offered as an interpretation of a set of test scores showing marked variations, was only recorded if

evidence was supplied that variability in the child's performance in school work had occurred and had been detected *before* the teacher had been invited to consider and to explain his uneven responses in the series of intelligence tests. Two general and cognate impressions were produced by the investigation and were strengthened as the analysis proceeded. The first was that very rarely did the teachers concerned find it possible to ascribe the large gains in score made by their pupils to the effects of coaching or practice *alone*. In almost all cases it was found necessary to postulate the operation of other factors—changes in the mood, motivation, and emotional state of the subjects for example—and evidence was adduced in support of these assumptions. Secondly, children in the control groups very frequently showed similar patterns of scores and gains of a size comparable to those obtained by children who had been intensively coached or practised. We have not pursued these individual studies far enough to permit us to state any firm conclusions, but a few examples from our findings will serve to illustrate the kind of evidence which we feel indicates that an improved performance in a coaching experiment cannot necessarily be related to the efforts of the coach.

(v) *Examples of Individual Case-studies.*

Example 1.—Here is the complete array of standardised scores for one particular boy :

1st test	..	109
2nd test	..	112
3rd test	..	113
4th test	..	134

a gain during the experiment of 21 points of standardised score. This boy, unfortunately perhaps, happened to be in one of the control groups and had not, therefore, enjoyed the benefits of systematic coaching. He was described by his head master as one of the brightest boys he had encountered in the school and the final score was regarded as the only one that was at all representative of his real ability. The boy was, it was reported, sensitive, conscientious, and rendered over-anxious about the eleven-plus examination by his parents who had stressed the vital importance of his securing a grammar school place. On the day of his examination he arrived at the school with his pockets stuffed with telegrams sent by his relatives in order to wish him success on this most momentous occasion. He failed to do himself justice, and was not awarded a place. Just before the final test administered at the end of our experiment, he received the news that a turn of events, which is too complicated to describe here, had ensured him a place in a highly reputed grammar school, and promptly celebrated the occasion by making a gain of 21 points. This is not an isolated case. Of the 119 children who had made exceptionally high gains, we found evidence—of a largely subjective nature it must be admitted—to suggest that in 76 cases the improvements were apparent rather than real in that their initial scores had been depressed by lack of incentive, ill-health, anxiety emotional disturbance, or conflict.

Example 2.—Boy (3 hours coaching group) :

1st test	..	100
2nd test	..	97
3rd test	..	90
4th test	..	102

The following is a summary of his teacher's comments :

" The third test score was ' unrepresentative.' The boy's family had just received news that his elder brother had been seriously wounded in Korea.

Before the final test, information was received that he was off the danger list and recovering satisfactorily."

Example 3.—Girl (control group) :

1st test	..	104
2nd test	..	105
3rd test	..	101
4th test	..	120

The following is a summary of her teacher's statement :

"This girl went into hospital for an operation some weeks before the first test. The operation left an unsightly scar on her legs and for some time prevented her from joining fully in the life of the school. She gradually recovered and eventually received a place in the school's net-ball team. This event took place during the experiment and was succeeded by a marked increase in her confidence and by an improvement in her school work."

Before leaving this brief account of our study of individual cases, I should like to quote the scores of a pair of twins who took part in the experiment. One whose initial score was 103 was coached for six hours and obtained 115 in the final test—a gain of 12 points. His brother, who was assigned by chance to the control group, had an initial score of 102 and a final score of 114—again a gain of 12 points. For this result I have no interpretation to offer.

III.—The problem of 'official' coaching.

The second major question on which disagreement has been expressed, and to which I promised to refer, concerns the recommendations that can justifiably be made to local education authorities on the basis of the evidence available. To coach—officially—or not to coach, is the question. Our own experimental work and our examination of that carried out by others have led us to conclude that officially sanctioned coaching is both unnecessary and undesirable. We consider it to be unnecessary because there is evidence to show that the provision of facilities for the working of a few practice tests can offset the effects of any coaching that parents and some teachers may be disposed to offer in addition.[1, 2] I wish to make it clear that in putting forward these recommendations, we do not envisage any attempts to ban coaching in or out of schools. In some quarters this interpretation has been put upon our statements. We recognise, on the contrary, that if parents or teachers wish to coach little can be done to prevent it (and, moreover, no matter what we say, they are unlikely to restrict themselves to a period of three hours for the purpose). What we do maintain is that if any education authority has reason to believe that coaching is being carried out in its area to an extent likely to cause injustice to some of the children who are to be examined, then the provision of three or four practice tests, held a few weeks prior to the test proper, will be sufficient to offset the effects of hole-in-the-corner attempts to outwit the examiners. We found that the greater part of the effects produced by practice occurred between the first and second tests.[1] For any further improvement it was necessary to wait for the test that was announced as being the last in the series, when a further but smaller improvement occurred. This final spurt is a common phenomenon in all investigations concerning the acquisition of skills and the improvements in performance that practice can bring about. There is no reason to suppose that it would be absent if the number of practice tests was limited, say, to three. Another potent reason for supposing that official practice would offset the effects of unofficial coaching lies in the fact that the latter is usually very badly done. We agree with Professor Vernon[4] that unless material is available which

is strictly parallel to the tests that are to be worked, the investment of a considerable amount of coaching effort is found to yield very meagre dividends. We have, therefore, partly from hard experience, come to regard coaching as a comparatively profitless pursuit—except perhaps for those who are engaged in the publication of the little booklets on the subject that flood the market nowadays.

As well as being unnecessary, we regard official coaching as undesirable. Many educationists who are concerned with the welfare of junior schools regard the implications of a policy of coaching for all as more gruesome than the evils that it is supposed to counteract. Most teachers with whom we have discussed this possibility are convinced that the encouragement of coaching by local education authorities would have an adverse effect on the life and curriculum of the schools, would give an added impetus to out-of-school coaching by parents, would lend an air of respectability to the activities of that increasing number of profit-making organisations which exploit the eagerness of parents to improve their children's chances of securing a grammar school place by persuasive propaganda on behalf of postal coaching courses, home coaching schemes and the like. The stirring up of all this feverish activity in preparation for the selection examination, it is argued, will inevitably increase the alarm and despondency that besets many primary school children during their final fateful year. We share some of those misgivings. We also believe the policy of coaching for all to be a mistaken one because there is evidence to show that teachers vary markedly in their effectiveness as coaches, and therefore, such a policy, far from operating in the interests of fairness, would serve to reintroduce just those evils that the introduction of intelligence tests into the selection procedure was intended to mitigate. Our experiment in which twenty primary schools took part showed that the differences between the mean gains of the schools taking part was significant at the 5 per cent. level, a result which has not impressed Professor Vernon who described it as 'a moderate level of statistical significance' and, therefore, presumably as insufficient evidence to set against his own conclusion that teachers do not differ in their capacity to coach. We have recently had the opportunity of analysing data supplied to us by Dr. Dempster and derived from coaching carried out in Southampton schools. Our statisticians have rendered us better service on this occasion in showing that the difference between the schools are significant at the 1 per cent. level—a level which one might, perhaps, describe as immoderate. Further evidence, related to this question, comes to us from a local education authority from which we obtained the results for the years 1948 to 1952 of Moray House tests administered as part of the selection procedure. The mean scores for the total age-groups obtained in the first intelligence test given in each year were as follows:

1948—101, 1949—102, 1950—104, 1951—104, 1952—104.

Many of the schools in the area followed this trend closely, but a few deviated markedly from the general pattern. The results for one school in which the education officer suspected that some fairly competent coaching was going on were as follows:

1948—114, 1949—122, 1950—125·5, 1951—128·5, 1952—127·5

It would appear from these results that, since a different group of children were involved in each year's tests, and there was no evidence that the mean level of the children's ability in the areas concerned was changing significantly, one can only conclude that teachers as well as children are capable of acquiring 'test sophistication' and that the ability to coach is itself susceptible to the effects of practice.

IV.—Conclusion.

In conclusion, I would venture to predict that within a few years this problem for which a solution is being sought in this symposium, will no longer be presenting itself. Two distinct trends are, I believe, discernible in the policies now being shaped by many of our local education authorities. One tendency is to seek some form of re-organisation of the secondary school structure which will serve to pierce at several points the iron curtain that in the past has separated those who ' pass ' from those who ' fail.' We do not suggest that the comprehensive school is the only form that this re-organisation can take. In many areas experiments are being tried, such as the provision of facilities for general certificate courses for the abler children in the secondary modern schools—to name only one innovation—which, if successful, will serve to lessen the anxiety of those parents who have hitherto regarded the grammar schools as the only institutions capable of providing a satisfactory type of secondary education. The other trend is for local authorities to place less reliance in making their allocations to secondary school courses on one set of examination papers. The use of a series of tests, the employment of teachers' estimates of their pupils' abilities, the introduction of additional methods of differentiating between the educational needs and potentialities particularly of those children who occupy the border zone in examination lists—all these tendencies lessen the vital importance for both parent and child of the examination and will presumably diminish the urge to coach for one misunderstood and consequently abused part of it.

V.—Summary.

1.—Systematic coaching given during the intervals between the administration of ten Moray House intelligence tests yielded a mean gain of 8·2 points of standardised score compared with a control group's gain of approximately five points.

2.—Ten forty-five minute periods of coaching for the Otis Advanced test resulted in a mean gain of nine points ; the control group's gain in this experiment was five points.

3.—The combined results of an experiment in which groups of children were coached for differing periods ranging from three to nine hours, showed a mean gain of 8½ points for the coached children and 6 points for the controls.

4.—In a large-scale inquiry involving twenty junior schools, the coached children made a mean gain of approximately 5 points, the children who were given unassisted practice showed a mean gain of 6 points, and the control group's gain was between 2 and 3 points.

5.—Significant differences were found between the results obtained by different teachers who supervised the coaching.

VI.—References.

[1] A. F. Watts, D. A. Pidgeon, and A. Yates : *Secondary School Entrance Examinations.* Second Interim Report on the Allocation of Primary School Leavers to Courses of Secondary Education. (Newnes Educ. Pub. Co., 1952.)

[2] J. J. B. Dempster : " Group Intelligence Tests—An Inquiry into the Effects of Coaching and Practice," *The Schoolmaster and Woman Teacher's Chronicle,* Jan. 3rd, 1952.

[3] S. Wiseman and J. Wrigley : " The Comparative Effects of Coaching and Practice on the Results of Verbal Intelligence Tests," *Brit. Jour. of Psych.,* XLIV 2, May, 1953.

[4] P. E. Vernon : " Intelligence Testing," *Times Educ. Sup.,* 25th Jan., and 1st Feb., 1952

[5] E. A. Peel : " Practice Effects Between Three Consecutive Tests of Intelligence," *Brit. Jour. of Educ. Psych.,* Nov., 1952.

SYMPOSIUM ON THE EFFECTS OF COACHING AND PRACTICE IN INTELLIGENCE TESTS

II.—Coaching for All Recommended.

By W. S. JAMES
(*Lecturer in Education in the University of Bristol*).

I.—The realities of the situation.

Coaching for the intelligence test is not new; it was rampant in the early 1930's. As a teacher at that time, I used to help to supervise the selection examination at one centre where candidates from the different elementary schools in the town sat for the examination. We noticed even then that those from certain schools on the word 'Begin!' hurriedly turned the page and got on with the first intelligence questions without stopping to read the detailed instructions. It was quite obvious they had met this sort of thing before. Candidates from other schools floundered nervously and had to wade through the instructions before getting the idea and so lost valuable time... My colleagues and I commented on this, year after year. Clearly, children from certain schools were handicapped by not having been introduced to intelligence test material in preparation for this competitive examination.

Since then the custom of coaching candidates for the intelligence test has grown considerably. Teachers have, indeed, received encouragement in plenty, and it is not surprising that they have taken the hint. In the 1930's an excellent series of articles by a chief education officer appeared in one of the teachers' journals, dealing with all types of intelligence questions, both verbal and non-verbal, offering teachers all they needed for coaching lessons. Others, well known in the educational world, have made freely available to teachers and parents their various tests of aptitude and intelligence which have been widely used for coaching purposes. There are now at least twenty different booklets entirely or partly devoted to intelligence test material available to all through the booksellers and it is no secret that some of these enjoy a prodigious sale. One of these booklets offers twenty-four one-hour lessons on intelligence tests, and no doubt many poor youngsters are put through this weary course by uninformed parents or teachers.

A few years ago I found that about two-thirds of Wiltshire candidates were being coached for the intelligence test in their schools at a time when it was officially assumed that no coaching at all was going on. They were being coached more or less openly from these booklets and tests, although some teachers preferred to disguise their activities under the pseudonym of 'English exercises.' It would be a callous teacher indeed who would allow his pupils to enter for the examination without at least explaining to them what an intelligence test was all about.

It is perhaps worth-while telling of an experience I had recently which illustrates what goes on in those areas where all practice and coaching for the intelligence test is forbidden. I must refer to the two local education authorities

concerned as A and B. Authority A decided to coach all its candidates for the intelligence test from the booklet which I had specially designed for the purpose. But, under neighbouring authority B, all practice and coaching was forbidden. It so happened that twenty-four candidates living just inside area A, taking the A examination, attended schools in B. A special request from authority A to authority B, asking that these twenty-four children be given the few lessons of coaching, was flatly refused. Coaching, we were told, could not be introduced into the B schools under any conditions, even if an outside teacher or I crossed the border to do it. So, with some difficulty, these twenty-four pure virgin children from several different schools in B were, therefore, gathered together one Friday afternoon on the soil of A, and I, feeling very guilty, went along to give them their first introduction to intelligence test material. I casually asked at the beginning of the lesson if anyone knew what an intelligence test was, and discovered that twenty-two out of the twenty-four had been thoroughly coached already along with their classmates in the B schools in preparation for the B examination, which also contained an intelligence test, and for which all coaching had been forbidden ! The children told me the names of the booklets they were using for this, and they certainly knew all the tricks and knacks. The two children who did not know whether they had received lessons on intelligence tests or not were two pathetic cases with I.Q.s somewhere near 70 and who stood no chance at all of getting into a grammar school. This year authority A has not bothered to repeat the special coaching of the few and I don't suppose that in this case it will make a scrap of difference to their results !

Several times recently I have had reports at second-hand that some teachers are making pencil copies of intelligence tests on the occasion of the examination when the secret tests are in the schools for half a day. I unearthed one head master who openly does so, and who has a little collection of such tests which he uses for coaching purposes. He supposes that any head teacher worth his salt would do the same. But even if it is only the exceptional teacher who makes his own copy, certainly all inspect the tests very closely as, of course, they do the English and Arithmetic papers too.

I want to make the point then, that the amount of coaching now going on is so great that it is futile to attempt to stop it. But, apparently, there are still administrators and committees who imagine that all practice and coaching have been banished from their schools because they have passed some rule forbidding it, so that all their candidates consequently start equal. Such people live on the moon and know little of what is going on down here on the earth ! The farcical position reminds me forcibly of what went on during the Prohibition period in the United States.

One consequence of the increase in the amount of test-sophistication over the last twenty years is that the successive Moray House tests have been standardised on populations which have gradually become more and more familiar with intelligence test material. It would appear, therefore, that the successive tables of norms must reflect this increasing sophistication, so that the tests are becoming harder and harder. We already know that the Scottish Survey of 1947,[1] which employed the same intelligence test as the 1932 Survey, showed an improvement in the national score compared with that of 1932, suggesting that mental ability is increasing in spite of good grounds for supposing that there is a downward trend in the national intelligence. It seems reasonable to suppose that the apparent improvement between 1932 and 1947 was the result of increased familiarity with the tests—even in Scotland, where the pressure of the selection examination is far less than in England and Wales. If the Moray House tests are, in fact, getting harder relative to their tables

of norms, then it is becoming increasingly urgent that all candidates receive some coaching otherwise the diminishing number of uncoached suffer greater and greater handicaps.

II.—PRACTICE WITHOUT COACHING CRITICISED PARTICULARLY FROM THE POINT OF VIEW OF THE RURAL TEACHER.

Let us now turn to the recommendations made by the National Foundation for Educational Research in their attempt to ease the admittedly unsatisfactory situation. They make the following concession in their recent publication:[2]

"At least two practice tests of intelligence should precede the examination used for allocation purposes."

But the Foundation does not intend the candidates to learn how well they did, what mistakes they made, or what instructions they misunderstood, for, curiously enough, these practice exercises are not to be 'gone over' in class. Instead of allowing this activity to follow the normal classroom sequence and pattern, the Foundation goes on to say:

"The policy of universal coaching should not be adopted; it is both undesirable and unnecessary."

That is, the Foundation recommends unassisted practice without coaching for the intelligence test. I will not stop to discuss the question whether in these days of financial stringency local education authorities can afford the money to give each candidate two practice test papers in addition to the cost of the main examination papers. The extra 9d. or so per head means hundreds of pounds over the whole administrative area and such sums are not easily found. But, I would like to ask whether the recommendation can, in fact, be expected to work. No doubt, ideally, coaching is, in the Foundation's words, both undesirable and unnecessary. But, if coaching cannot be stamped out under the existing traditions and circumstances, then the recommendation remains so much hot air.

The recommendation of practice without coaching might, perhaps, be expected to work in large towns and cities, at least as far as the schools are concerned, and indeed, there is at least one county borough where a similar system appears to be functioning well enough. Of course, what goes on outside school is another matter. In the towns the head teacher is very much the representative of his education committee, and immediately under its thumb, and it is necessary for him to obey its instructions to the letter, otherwise the news would soon get round. Usually, he is not part of the local community in which he teaches, but moves off at four o'clock to a different part of the town. He is immune from any local criticism which might arise if, following his Committee's instructions, he throws two lots of unmarked practice intelligence exercises into the waste paper basket.

The village head mistress, in her small village school, is in quite a different position. She is an important part of the social life and structure of her little community. She lives in the village, lodging, perhaps, with a family whose children attend her school. She has often known her pupils from birth onwards and she is invariably devoted to their interests. Regulations made at some distant county hall, often by people not in touch with the village schools, may need interpreting according to local exigencies. The children depend upon her for the type of secondary education they are to get and she is in very close touch indeed with parental anxieties and aspirations. The National Foundation is apparently prepared to ask her to throw two lots of unmarked practice intelligence test exercises into the waste paper basket! What about her reputation among the villagers, a thing she cannot allow to suffer? How will the

local gossip react to the head mistress' apparent failure to do her job and what will opinion say down at the pub ? Is it really fair to her to ask her to do this ? Is it not something beyond what we should reasonably expect from human nature ? Does the National Foundation really believe its recommendation would work in rural areas ? The head mistress knows that her colleagues in neighbouring villages will be tempted to mark and go over those practice exercises. Is she to let her own children down by failing to do the same ? Surely it would be much more satisfactory and satisfying to all if she were allowed to correct the exercises, going over the mistakes and showing her pupils what they had misunderstood. The natural inclination of teachers is to do this and this is all that coaching means. I sometimes wonder what all the fuss is about ! Let us then interpret the National Foundation's experimental results not in their cold and statistical way, but with some insight into the real situation in real schools, remembering that over half our schools are rural.

The pupils should be told how well they have done and what mistakes they have made if we are to reduce their nervousness in face of the unknown. If they are put at their ease as far as possible, they will then better show their true ability in the examination. We must remember, too, that although we speak of the 11 plus examination, 11 plus is the age of entry to the grammar school. Many are usually only ten when they sit for the intelligence test, and in some areas a substantial number sit at 9 plus, that is, before their tenth birthday. Is it really fair to these immature and usually nervous children to place before them those very frightening and forbidding intelligence tests without adequate preparation to avoid the ' shock ' of meeting the new situation ?

It is idle, too, to try to persuade teachers that a few practice tests are as good as any amount of coaching. This conclusion arrived at by some experimenters,[2, 3] seems to run contrary to common sense. Those who proclaim it have not always made clear what exactly they understand by ' coaching,' presumably meaning oral and blackboard work only. This is artificial and not the natural classroom procedure. No teacher would prepare his pupils for a written examination in, say, arithmetic, solely by oral and blackboard instruction ; the children obviously need practice at working the sums themselves on paper. In the same way coaching for the intelligence test is not merely blackboard instruction, but also the working of practice tests and the correction and discussion of errors. Oral instruction without practice is just as artificial as unassisted practice without oral discussion, and figures showing gains produced by either alone are likely to remain very theoretical, having little or no reference to the real classroom situation. On the job ' coaching ' naturally means a blend of practice with oral instruction, a combination which has been shown to produce gains substantially greater than those obtained by practice alone,[4, 5] as common sense would seem to indicate.

And then there is the parents' point of view. I shall only deal briefly with this. But there is, of course, considerable anxiety felt by middle class parents, well able to provide their children with a good home background and willing to back them throughout a full grammar school course—factors often neglected by those selecting pupils for grammar schools—but who are no longer free to secure for them the advantages of the grammar school by paying fees. The result is that such parents are tempted to coach their children for the intelligence test. I cannot blame them. Since when has a parent lost the right to help his child face an examination ? There is not yet complete atrophy of parental responsibility even under the Welfare State. No ruling of the Foundation or of any educational authority will prevent middle class parents from doing what they can to assist their children in this way. Certainly, parents will not be convinced

that two unmarked and uncorrected practice tests are as effective as some thorough coaching at home. The coaching will go on. The danger is not that parents will coach, but that they will over-coach, for the Foundation's recommendation may well have the effect of encouraging black-market coaching at home.

III.—THE PRACTICAL SOLUTION TO THE DIFFICULTY—COACHING FOR ALL.

It seems to me that the only way of ending the farce, if indeed the intelligence tests are to survive as part of the selection process, is to give all candidates the minimum amount of coaching which will enable them to do themselves full justice in the test. *All* candidates are then given a flying start and not just some of them. This appears to be the obvious and simple way out of the dilemma. Let them all start equal. They will never start equal if we try to prohibit coaching.

Accordingly, at my suggestion coaching for all was introduced into the areas where I was then serving as Chief Examiner—Gloucestershire and Wiltshire. I prepared a special booklet,[6] offering all candidates three lessons and a practice test, and this limited amount of instruction was authorised in all primary schools in these counties during the month or so before the examination in order to iron out the inequalities resulting from widespread unofficial coaching. Teachers were asked to treat this preparation more as a party game than school work, to correct the exercises and discuss errors. Candidates would then get the 'hang' of an intelligence test, understand its language, feel that they had met this sort of thing before, and know what was expected of them. Teachers were given a strong warning about the futility of over-coaching, since experiments show that children over-coached for several months before the examination are unlikely to do better and, in fact, may actually do worse than those coached once a week for a few weeks only.[4] Within this latter period of time, interest and freshness can be maintained and boredom avoided. It appears to me certain that this preparation reduced the hazards of the examination test.

I thought it would be worth-while finding out what the teachers themselves think about official coaching for all, and I recently spent some days visiting rural schools in Wiltshire and discussing the position with as many heads and assistants as I could meet. I found that official and above-board coaching is welcomed everywhere because it legalises the previous under-the-counter activity which could not be stopped. The black market has become the white market in Gloucestershire and Wiltshire, and relief is felt by all. Many teachers confessed to feelings of guilt in the past, and a good many consciences are relieved. All seem to think that practice without coaching could not be made to work satisfactorily in rural schools, and all are agreed that things are now fairer than before. All seem in favour of continuing with the official coaching and, in the case of Gloucestershire, the experiment with official coaching has now passed through its second year with apparently complete success.

IV.—SOME STATISTICS OF OFFICIAL COACHING IN WILTSHIRE.

The results of intelligence test scores in Wiltshire since Dec., 1947, may be summarised in table on following page.

The introduction of official practice and coaching over the whole county administrative area was followed by an average rise in I.Q. of about 4·3 points for boys and 5·5 points for girls (compared with the 1951 figures). Since about two-thirds of the candidates were previously receiving some sort of coaching already, it means that this average rise of about 5 points is largely, although of

Date	Moray House Test Used	Average Score Boys	Average Score Girls	Girls' Superiority
Dec., 1947	M.H.T. 38	99·95	102·10	2·15
Dec., 1948	M.H.T. 40	101·28	102·44	1·16
Dec., 1949	M.H.T. 41	101·20	101·68	·48
Dec., 1950	M.H.T. 43	99·57	101·28	1·71
Dec., 1951	M.H.T. 45	99·39	100·99	1·60
Official coaching now introduced.				
Dec., 1952	M.H.T. 47	103·71	106·46	2·75

course, not entirely, due to the instruction received by the remaining one-third, whose actual increase in score must have been considerably more than this, and whose position in the county order of merit would have suffered if this coaching had not been given.

For example, if we make the reasonable assumption that the previously uncoached one-third have benefited by 9 points of I.Q. and that the remaining two-thirds, who would in any case have received some sort of coaching, have benefited by 3 points (making the total average rise of 5 points), then there is a relative gain of 6 points, which becomes 12 points when, as is done in Wiltshire, the I.Q. is doubled before adding it to the English and Arithmetic quotients. Twelve points in the border-zone make a difference of over 250 places in the Wiltshire County Order of Merit! It follows that, if the 'red line' were drawn across the Wiltshire Order of Merit, about 8 per cent. of those entering the grammar schools would owe their success to the policy of official coaching for all; while under previous arrangements this 8 per cent. of places would have been wrongly filled by candidates coached on the black market!

The figures mean that much injustice has been going on and still is going on under many authorities, particularly where the I.Q. is doubled and where the final decision depends almost entirely on the mark sheet.

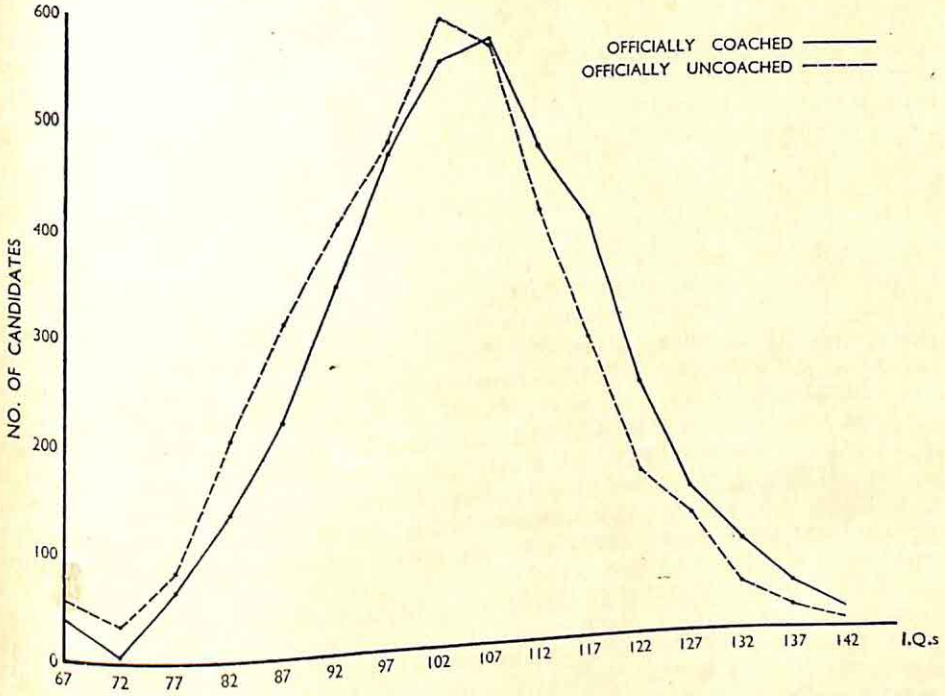
The distribution of the coached scores (Dec., 1952), is as follows:

	140 plus	135–139	130–134	125–129	120–124	115–119	110–114	105–109	100–104	95–99	90–94	85–89	80–84	75–79	70–74	70 minus
Boys ..	11	22	45	66	118	117	212	282	293	254	198	132	83	50	7	29
Girls ..	8	23	43	72	121	218	253	287	256	214	147	88	56	18	0	10
Total	19	45	88	138	239	395	465	569	549	468	345	220	139	68	7	39

Average Boys Score 103·71 (Standard Deviation 14·18).
Average Girls' Score 106·46 (Standard Deviation 12·96).

13·2 per cent. of the boys and 14·7 per cent. of the girls scored 120 and over.
61·9 per cent. of the boys and 70·6 per cent. of the girls scored 100 and over.

The average increase seems to be fairly evenly distributed throughout the scale, as shown in the graph. The unbroken line shows the distribution of the coached I.Qs., and for comparison, the dotted line a typical distribution (Dec., 1949) before official coaching was introduced. No very obvious 'bunching' has occurred in any part of the scale as a result of coaching, the curve being displaced bodily a little to the right.



V.—SOME OBJECTIONS ANSWERED.

Coaching for all has been objected to on the grounds that it is not educational. But the time recommended for official coaching is so small—a few hours only in a school life—that the matter has no significance. And in any case does nothing of a non-educational nature ever go on in school?

Coaching has been objected to on the grounds that teachers differ in their ability to coach. No doubt they do; variation among teachers is inherent in any teaching situation, but it is claimed that the unfairness so introduced into the arithmetic and English marks may be offset by the uncoached intelligence test score. This argument clearly has force only if coaching can be completely prohibited. But as it can't, it is obviously better to have *all* children coached even though the standard of coaching may vary somewhat, than to have some children well coached and others quite uncoached. The objection is a highly theoretical one and falls to the ground when examined realistically.

Any such unfairness which results from a variation in teaching standards in different schools can be greatly reduced, if not eliminated altogether, by a system of selection which minimises the importance of marks and I.Q.s and places more emphasis on evidence concerning the whole child, including his character and the level of aspiration in his home. Elsewhere I have written something about the hazards necessarily present in any marking scheme; and in the same booklet[7] two Wiltshire head masters have discussed their methods of assessing the whole child by making use of the opinions of the primary school teachers as the major factor in selection. In any such system the marks and I.Q.s become nothing more than evidence to be taken into account in the individual assessment of each child. Against this background the question of coaching for the I.Q. is seen in its true and comparatively unimportant perspective—the means to a just provision of one of the smaller pieces of evidence on which the final assessment is made. But, as long as there are

education committees who regard marks and I.Q.s as they regard inches on a ruler or degrees on a thermometer, that is, measurements which have extreme objectivity and in which complete trust may be placed, and who use their grand total of marks as the chief arbiter of the child's fate, then so long will coaching for all candidates remain a real and urgent need.

VI.—Summary.

1.—Coaching for the intelligence test has already grown to such proportions both inside and outside school, even in those areas where it is formally prohibited, that it is futile to make further attempts to stop it.

2.—The National Foundation's recommendation of practice without coaching for the intelligence test cannot be expected to work, especially in rural areas. It ignores the realities of the situation and makes too great demands upon human nature.

3.—The National Foundation's recommendation will tend to encourage black-market coaching by parents and teachers in out-of-school hours.

4.—Official coaching for all candidates, limited to a few lessons during the four or five weeks prior to the examination, is offered as a practical solution to the problem under the present circumstances. The futility of over-coaching must be made clear to teachers and others.

5.—Although about two-thirds of Wiltshire candidates were already receiving some sort of black-market coaching, the introduction of official coaching for all resulted in an overall *average* rise of 4·3 points for boys and 5·5 for girls. The average increased score among those previously uncoached must have been considerably more than this. The increase is fairly uniformly distributed throughout the scale.

6.—This *average* rise of about 5 points is not a negligible amount. It means that the uncoached suffer a considerable handicap particularly in those areas where the I.Q. is doubled in arriving at an order of merit, and where selection is largely made by drawing a red line across an order of merit. Coaching for all will iron out this major inequality and remove much injustice.

VII.—References.

[1] Scottish Council for Research in Education: *The Trend of Scottish Intelligence* (University of London Press, 1949).

[2] A. F. Watts, D. A. Pidgeon and A. Yates: *Secondary School Entrance Examinations* (Newnes Educ. Pub. Co., 1952).

[3] S. Wiseman and J. Wrigley: "The Comparative Effects of Coaching and Practice on the Results of Verbal Intelligence Tests," *Brit. J. of Psych.*, XLIV 2, May, 1953.

[4] J. J. B. Dempster: "Group Intelligence Tests—An Inquiry into the Effects of Coaching and Practice," *The Schoolmaster and Woman Teacher's Chronicle*, Jan. 3rd, 1952.

[5] P. E. Vernon: "Intelligence Testing," *Times Educ. Sup.*, Jan. 25th and Feb. 1st, 1952.

[6] *Practice and Coaching Exercises for Intelligence Tests* (Wheaton and Co., Ltd., Exeter, 1952).

[7] *Studies in Selection Techniques for Admission to Grammar Schools*, University of Bristol Institute of Education Publication No. 3 (University of London Press, Ltd., 1952).

THE VOCATIONAL PREFERENCES OF SECONDARY MODERN SCHOOLCHILDREN

By MARY D. WILSON
(*Senior Educational Psychologist for the Borough of Ealing, Middlesex*).

Part II—The Development of a Realistic Attitude to Vocations.

I.—*Vocational interest maturity.* II.—*Results of investigation into the development of vocational interest*: (*a*) *recollected earlier wishes*; (*b*) *vocational phantasies*; (*c*) *the fixation of vocational choice*; (*d*) *growth of realism with age*; (*e*) *relation of intelligence to vocational interest maturity*; (*f*) *relation of maladjustment to vocational interest maturity.* III.—*Reasons given by children for their vocational choice.* IV.—*Environmental factors associated with vocational choice*: (*a*) *influence of people*; (*b*) *influence of the school curriculum.* V.—*Impressions gained from interviews.* VI.—*Discussion.* VII.—*Summary.*

I.—Vocational interest maturity.

Part I of this investigation has shown that most of the children concerned, by the time they reached their last two years of school, had formed vocational interests broadly in keeping with their reasonable expectations. The present study will, however, prove more valuable if it can be shown by what processes of maturation or experience a satisfactory degree of realism can be achieved. From the outset of the enquiry, it was assumed that the vocational interests of the children would have changed frequently and it was hoped that a study of these changes might establish the relationship between vocational preference and social and intellectual maturity.

Genetic studies of vocational preference by Lehman and Witty,[5] Freeston[2] and Menger[8] have shown that, while some occupations are popular at all ages, the majority wax and wane with the maturation of the children. There has, however, been insufficient evidence to show whether children necessarily improve as they get older in the ability to make suitable vocational choices. The problem is complicated by the interaction of two opposing tendencies: as the child's experience widens he becomes aware of vocational possibilities previously beyond his ken, but, eventually, increase of knowledge brings with it awareness of his own limitations. Hence one of the first results of the spread of vocational information may be a decrease in the number of realistic choices.

A child may, however, be considered immature in his attitude to vocations if his interests are those characteristic of a much younger child, and it has been claimed by Lehman and Witty that dull children tend to resemble young children in this respect.

Another aspect of the development of vocational interest which has been already investigated, is the ability of older children to accept the realisation that some of their ambitions are not practicable. In this country Stott,[10] Lingwood[6] and Stephen[9] have commented on the tendency of girls to accept clerical work after relinquishing more attractive hopes. Freeston[2] found that both boys and girls increased with age in the ability to distinguish between their vocational wishes and their considered aims. In this respect, if not in the appropriateness of their free wishes, the children increased in realism with age.

II.—Results of present investigation into the development of vocational interest.

(*a*) *Earlier vocational interests recollected by the children.*

In this investigation the earlier interests of the children were studied retrospectively. Each child was asked to mention any earlier wishes he had had, and to give his age at the time. These wishes were recorded in only two groups—before or after the age of eleven. The most commonly reported early interest of the *boys* was in engine or motor vehicle driving—so confirming a widespread popular belief. The Services, including police, and farming had also been popular at the primary stage, but interest in sport seemed to have increased after entrance to a secondary school. A good number of the boys recorded that when very young they had wished to do everyday jobs, such as those of the milkman, the coalman, the postman, and others who come to the house ; but these were scarcely desired at all after the age of eleven. The skilled trades, which accounted for the bulk of the boys' final choices, were not frequently mentioned as early interests, but accounted for 31·3 per cent. of the wishes recalled from the secondary school period. This means that many of the boys who finally chose one of these skilled trades had previously considered another of a different nature but from the same general field.

Of the *girls' recollected wishes*, nursing was the most popular occupation recalled from the primary school period, and still fairly popular in the secondary period. This confirms the impression gained from Menger[8] that interest in nursing declines with age, though slowly. Other interests more common at the primary than at the secondary stage were in music, dancing, acting and teaching. Shop work seems to have been acceptable to these girls at all ages ; but interest in hairdressing, dress-making and clerical work showed a marked increase at the secondary stage. Interest in the Arts seemed to have persisted well into the secondary stage, though it accounted for very few of the final choices. Interest in clerical work, the most characteristic choice of the secondary modern schoolgirl, did not as a rule predate entry upon the secondary stage of education.

(*b*) *Vocational Phantasies.*

The distinction aimed at by Questions 1 and 4 on the first questionnaire, was between vocational choice and relatively free vocational phantasy, Question 4 being so phrased as to reduce to the minimum any consideration of suitability or availability. In answering these questions, most of the children showed that they were well able to distinguish their attainable and unattainable ambitions. 65·6 per cent. of the boys and 69·5 per cent. of the girls gave substantially different answers to the two questions, this being an even greater disparity that the 50 per cent. (approximately) found by Freeston[2] at the same age' It is strikingly evident from Table II that if the boys felt that there were no obstacles in the way of their ambitions, building and engineering would lose about half of their candidates, whereas the Services, sport and farming would gain. Similarly, fewer girls would enter shops and offices ; they would rather become dancers, opera singers or film stars ; they would welcome the opportunity to travel and achieve personal fame. Moreover, the differences between choice and phantasy were actually much more striking than is revealed merely by comparison of the percentages. The miscellaneous groups, for example, were very differently composed : the boys' miscellaneous *choices* including printing and clerical work, but their miscellaneous *phantasies* including science, medicine and invention ; and within the same occupational groups there were differences in both the type of work and the grade aimed at. Boys who mentioned building in answer to both questions were more likely to choose brick-laying in answer to

TABLE I

EARLIER VOCATIONAL INTERESTS

	Boys' Occupations	Times mentioned	Per cent.	Girls' Occupations	Times mentioned	Per cent.
PRIMARY PERIOD	Drivers and firemen	184	44·4	Nursing	195	35·8
	Forces	87	21·0	Arts	104	19·1
	Farming	42	10·1	Business (shops)	67	12·3
	Everyday jobs	29	7·0	Hairdressing, dress-making	54	9·9
	Sport	28	6·3	Teaching	47	8·5
	Skilled trades and semi-skilled	20	4·8	Domestic work	19	3·5
	Acting	11	2·6	Travel	16	2·9
	Miscellaneous	16	3·8	Farming	12	2·2
				Clerical	12	2·2
				Miscellaneous	19	3·5
	TOTAL	415	—	TOTAL	345	—
SECONDARY PERIOD	Sport	57	17·3	Haidressing and dress-making	107	21·3
	Engineering	54	16·4	Nursing	72	14·8
	Transport	52	15·8	Shops	63	14·0
	Forces	52	15·8	Clerical work	62	12·7
	Building	49	14·9	Arts	59	12·1
	Farming	15	4·6	Travel	37	7·6
	Arts	13	4·0	Teaching	20	4·1
	Business	12	3·6	Domestic work	16	3·3
	Science	9	2·7	Farming	14	2·9
	Miscellaneous	16	4·9	Miscellaneous	33	6·8
	TOTAL	329	—	TOTAL	488	—

TABLE II

COMPARISON OF VOCATIONAL CHOICE AND PHANTASY.

BOYS (N=780)	Choice	Phantasy	GIRLS (N=733)	Choice	Phantasy
OCCUPATION	Per cent.	Per cent.	OCCUPATION	Per cent.	Per cent.
Building	21·3	11·0	Shops	16·6	7·0
Engineering	33·7	17·5	Clerical—Telephonist	28·8	9·4
Transport	6·1	9·6	Nursing	12·0	12·8
Services	5·3	12·2	Farming (animals)	4·4	4·8
The Arts	5·7	6·4	Domestic (Marriage)	3·1	12·4
Sport	1·3	14·8	Hairdressing	8·6	6·6
Farming	6·4	9·7	Dressmaking	12·5	10·8
Business (Shops)	3·8	5·6	The Arts (without self-display)	2·1	3·4
Miscellaneous*	14·5	8·4	The Arts (with self-display)	1·4	12·8
Undecided	1·7	4·8	Travel	1·5	10·5
			Miscellaneous*	7·5	7·1
			Undecided	1·5	2·7

* The miscellaneous *choices* bear no relation to miscellaneous *phantasies*.

Question 1, whereas in Question 4 they would express the wish to own a private building organisation. Of the boys who answered both these questions, 34·4 per cent. gave the same or similar answers; 20 per cent. mentioned an entirely different occupation in Question 4, though not one making greater demands on intelligence; 25·6 per cent. mentioned a similar occupation, but of higher grade; and 20 per cent. gave answers entirely different both in type and grade. The occupations described as being of the same intelligence grade though different in type were, however, really more ambitious choices, since they were mainly occupations such as acting and sport depending on a high degree of *specific* ability. The *girls'* miscellaneous *choices* included factory work, whereas under the heading of *phantasy* the miscellaneous group included vague desires for great wealth and fame. A substantial number of the girls substituted marriage in answer to Question 4. Where, for any occupation, the percentage of choice and phantasy were very similar, as with dress-making, the actual description of the ambition was frequently very different: a girl who had chosen in answer to Question 1, to be a dressmaker, would perhaps state, in answer to Question 4, that she would like to be a world-famous dress designer. Many of the phantasies were for higher grades of occupation than the choices. Of the girls who answered both Questions 1 and 4, 30·5 per cent. gave the same answer: 16·8 per cent mentioned similar occupations but of a higher grade, in Question 4; 28·9 per cent. mentioned different occupations, not necessarily demanding more intelligence (including marriage), and 23·8 per cent. mentioned occupations very different both in nature and grade. As in the case of the boys, many of the 'different' occupations were more ambitious choices, since they depended on a high degree of specific ability, such as would be required by opera singers and ballet dancers. Roughly 60 per cent. of the boys were considerably more ambitious in their answers to Question 4 than in answer to Question 1. The proportion is rather smaller with the girls on account of the number substituting marriage. Evidence from this section suggests, therefore, that where the children taking part in this investigation made appropriate vocational choice, the reason does not appear to have been lack of imagination.

A point to note about the vocational phantasies is their similarity to the recollected early wishes. This fact suggests that the earlier wishes had been abandoned, not because the children no longer found them attractive, but because they seemed unattainable. This hypothesis is supported by the reasons given by the children for the abandonment of their earlier wishes. Only 278 *boys* answered this question, but of these 13·7 per cent. said that they had not really given them up, and 20·6 per cent. mentioned the realisation of their own limitations or other difficulties, such as failure to gain admittance to grammar or technical school. Of 397 *girls* who answered the question, 5·5 per cent. said that they had not really given up the wish, and 33·5 per cent. mentioned difficulty of attainment. There were, nevertheless, considerable numbers of both boys and girls who described their previous wishes as "silly," and an even larger number whose widening experience had drawn attention to less desirable features of the occupation mentioned. The relation between the phantasies, the earlier wishes and the reasons given for their abandonment suggests, therefore, that the children had been able to achieve a satisfactory standard of realism by the modification or abandonment of their vocational phantasies, in accordance with growing awareness of their own limitations, and a new ability to study occupations from various aspects. There is some evidence that this realisation often occurred near to the time of transfer to secondary school or later.

(c) *The Fixation of Vocational Choice.*

Confirmation of this last point is provided by the children's answers to the question, " How long ago did you decide what you wanted to be ? " 90 per cent. of the boys and 87·2 per cent. of the girls had made up their minds after transfer to secondary school ; 58·3 per cent. of the boys and 55·8 per cent. of the girls had made the decision less than eighteen months previous to the filling in of the questionnaires. Some vocational interests seemed to be significantly* of longer standing than others, particularly farming and the Services among the boys. It might have been expected that the same would be true of the interest in transport which was also characteristic of the primary stage, but there is little doubt that this tendency would be obscured by frequent changes in the specific choices of boys with this unchanging general interest. One example was a boy who had recorded the following early wishes : engine driver—aged 6 ; bus driver—aged 9 ; long-distance coach driver—aged 11. His choice in Question 1 was ' Army.' When asked why he wanted to joint the Army, he said that he wanted to drive a truck. Of the girls' choices, interest in shop work, offices and telephony were the most recent, whereas nursing, the Arts, dress-making and hairdressing were interests of the longest standing. Interest in the last two mentioned had not, like the interest in nursing, persisted from the primary stage, though there was a slight† tendency for this to be true of dress-making. Work in a shop had appealed to many of the girls at all ages, but the type of shop chosen varied with age.

It seems safe to conclude from this section that early fixation, i.e., before the age of eleven, is unusual. It is associated particularly with the survival value of some interests generally found to be characteristic of young children, but making a deep appeal to many children. These occupational interests, when found to be impracticable, are abandoned with reluctance by many children, though in normal circumstances the children are able to make the necessary modification before leaving school.

(d) *Growth of Realism with Age.*

It appears from the present investigation that in many cases the children's earlier wishes had been very different in nature from their final choices, but there was little indication that younger children had wishes less appropriate in their demands on general intelligence, except in the case of little girls wishing to be nurses or teachers. Nevertheless, many of the discarded ambitions, like the vocational phantasies which they so often resembled, were for occupations demanding a high degree of specific ability. In this respect there are signs of a marked advance in realism as the children get older.

It was also possible, from the data provided by the questionnaires, to determine whether the children due to leave at the end of the current term made more appropriate choices than those who still had several terms of school life before they needed to make up their minds. Comparison of the four age groups‡ showed, however, no tendency for the older children to make more appropriate choices in relation to intelligence. The boys showed, moreover, no significant variations in the *type* of occupations chosen. The girls, who, it will be remembered, made final choices less in accordance with the occupations available, did show some significant changes,§ those nearer to leaving school

* The Chi-squared test gives significance at ·01 level.
† Significant at the ·05 level.
‡ According to which term they were due to leave school.
§ Cross tabulation of age group with occupations chosen gives Chi-squared value 48·74 ; degree of freedom 30 ; p = ·02.

being less likely to choose the Arts and more likely to choose office work. These changes are consistent with a move towards more available occupations. In general, however, there is very little evidence of an increase in realism, on either criterion, during the last four terms. The explanation would seem to be that the children had, already, soon after admission to secondary school, directed their vocational interests towards the general field of occupations available to them* though this did not prevent their continuing to make frequent changes of specific vocational choice.

(*e*) *Relation of Intelligence to Vocational Interest Maturity.*

The present investigation has shown that less intelligent children made less suitable choices in relation to intelligence, but not in relation to occupational availability.† Nor was there any strong evidence to support the contention of Lehman and Witty[5] that the less intelligent chose occupations characteristic of younger children. Boys choosing transport and farming, and girls choosing nursing, were on the average slightly but not significantly less intelligent than the rest of the group.

There was, however, a marked tendency, observable in both boys and girls, for the more intelligent children to distinguish better between choice and phantasy. When they did give different replies to Questions 1 and 4, dull children were more likely to choose different *types* of occupation rather than higher grades, whereas bright children frequently mentioned in Question 4 an occupation related to their earlier choice but of a higher grade. Since the ability to separate reality from phantasy has been shown by Freeston[2] to increase with age, this in one respect in which dull children were relatively immature.

(*f*) *Relation of Maladjustment to Vocational Interest Maturity.*

It was also possible to follow up Hotoph's suggestion[4] that immaturity of interests might be associated with certain personality traits rather than with low intelligence. This was done by comparing the vocational choices of the children described as maladjusted with those of the well-adjusted and normal groups. The numbers of boys in this part of the enquiry was too small to justify statistical analysis ; but the maladjusted boys did not seem to be less realistic in relation to their intelligence, nor to distinguish less well between reality and phantasy than normal boys. One occupation, farming, characteristically chosen by younger boys, was chosen by seven maladjusted boys and only one well-adjusted boy. There was also a slight tendency for maladjusted boys to date the adoption of their ambition from earlier days. It cannot, therefore, be said that the data either confirm or disprove the hypothesis that maladjusted boys are immature in their attitude to vocations, but where differences do occur between the attitudes of maladjusted and normal boys these differences are all in the direction consistent with the hypothesis.

The group of girls described as maladjusted, as well as being larger, was more comprehensive than the group of maladjusted boys. The maladjusted girls were not less realistic in relation to their intelligence than normal girls, and there was only a slight tendency for them to distinguish less well between choice and phantasy. There were, however, significant‡ variations in the type of occupation chosen by the maladjusted group. Whereas well-adjusted girls were more likely to choose office work, nursing and hairdressing were more

* See discussion of recollected early wishes, page 3 supra.
† See Part I.
‡ Chi-squared—25·41 ; degree of freedom 10 ; $p < \cdot 01$.

often chosen by the maladjusted. Since these occupations are those for which the demand was disproportionately great, and since nursing was the occupation most popular with children at the primary stage, there is some support for the hypothesis that the maladjusted girls were less mature and less realistic in their vocational choice.

III.—REASONS GIVEN BY CHILDREN FOR THEIR VOCATIONAL CHOICE.

Whether or not children are truly realistic in their attitude to vocations, cannot be decided merely by studying the appropriateness of the actual choices made, since limited imagination may lead to correct choice. In the present investigation into reasons for vocational choice, no attempt was made to assess the adequacy of the reasons stated by the children except by relating them to the type of occupation chosen. It was felt that if the reasons were found not to vary with the occupations chosen, this fact would indicate an absence of genuine realism, even though the occupations chosen were appropriate. Reasons were asked for in connection with the occupations disliked as well as those chosen, and an attempt was made to distinguish precipitating causes from other reasons by the inclusion of the further question, "What made you decide (what you wanted to be)?"

TABLE III

REASONS FOR VOCATIONAL CHOICE.

Reason.	Frequency per cent.	
	Boys	Girls
Liking the work	41·4	48·3
Working conditions	10·6	9·6
Prospects of promotion	10·3	7·7
Good pay	7·6	6·4
Influence of people	5·7	1·2
Working companions	3·0	12·0
Variety of work	6·6	3·8
Excitement	1·7	·3
Curiosity	2·3	—
Having necessary skill	5·5	5·0
Easy work	·9	1·0
Ease of procuring work	·5	1·1
Being useful	1·8	2·7
Social prestige	·9	—
Miscellaneous	1·3	·7
	(N=1693)	(N=1780)

The reasons for vocational choice given in the children's own words have been classified as shown in Table III. Apart from liking the work, the most important reasons were: Comfortable and agreeable working conditions; good pay and prospects of promotion; the influence of admired friends or relatives; the chance of meeting interesting or friendly people at work; the need for variety and excitement; and the possession of some required skill or knowledge. The mere ease of procuring work was mentioned very rarely, though this had been found to be an important motive in earlier enquiries held when there was less demand for juvenile labour.[11, 3] Interesting differences were found in the reasons given by boys and girls respectively. Among the

working conditions mentioned by boys, fresh air and being in the open were by far the most important, whereas the girls were more likely to mention cleanliness, absence of noise and an even temperature. Girls were more interested than boys in working with other people. The variety, excitement and curiosity motives were much stronger with the boys, who also laid rather more stress on promotion prospects.

The study of reasons for disliking some occupations in addition to confirming the above motives also indicates the importance of two motives not revealed by the reasons previously given. Although the desire for easy work did not appear among the reasons for choice, about 6 per cent. of the children mentioned difficult work as a reason for dislike. Lack of social prestige was also mentioned as a reason for dislike by 5 per cent. of the girls and 2 per cent. of the boys.

In some cases the answers to the question, " What made you decide (what you wanted to be) ? " were repetitions of the reasons given for vocational choice. As a rule, however, the children gave different answers, mentioning not what they considered attractive features of the work, but some incident or situation which led to a definite decision as distinct from a general interest. Predominant among these was advice or information given by friends, or relatives. Another very important factor was direct experience of the work, either by watching others engaged in it or by actually trying out either the job itself or some activity closely resembling it. Closely associated with the latter was the influence of school subjects, particularly woodwork, metalwork and needlework. Frequently mentioned also were visits to factories arranged by the schools ; and the opportunity of helping friends or relatives with their work during holiday times. These facts are in keeping with MacKaye's opinion, based on case studies,[7] that children rarely choose occupations of which they have no personal experience.

When the children's reasons were related to the occupations chosen, a highly significant association was revealed.* Boys choosing the *building industry* were disproportionately influenced by working conditions, especially by the prospect of working in the open-air. They also appeared to be influenced by people more than boys choosing other occupations, and gave correspondingly less consideration to the nature of the work. Those choosing *woodwork*, on the other hand, often believed themselves to possess the necessary skill. Boys choosing *electrical work* were among the most ambitious, showing proportionately less interest in working conditions and more in the future prospects of the trade. Prospective *Motor engineers* were even less pre-occupied with conditions, but more with the nature of the work. Boys interested in *transport* were attracted by the variety of places visited, and to some extent by the excitement and adventure motives ; they were less likely to mention interest in the type of work they would be doing. The same motives influenced those choosing *Defence*, but to an even greater degree. The reason most frequently given by boys who chose *farming* was a desire to work in the open-air ; this was similar to the motive of some of those choosing building work, but much more pronounced. Other occupations such as printing, clerical work, shops and the Arts were chosen by numbers rather too small to justify statistical analysis ; but some suggestions can be made, with appropriate reservations. Boys choosing *printing* frequently considered it well paid ; those choosing *clerical work* felt that they had the appropriate abilities, and those wishing to work in *shops* tended to declare an interest in people. Interest in the *Arts* showed no

*The Chi-squared test was used to establish the statistical significance of association between reason and occupation. All the cases cited are significant at ·01 level.

significant association with any type of reason, but this was not to be expected in such a small and heterogeneous group of occupations.

Of the girls those choosing *shop work* were disproportionately interested in people, whereas those choosing *office work* tended to stress good pay and to a lesser degree, pleasant working conditions. *Telephonists* have been included with office workers on account of the similarity of their interests, except that office workers were significantly less and telephonists slightly more interested in people than other groups. The reasons given for the choice of *nursing* showed mainly interest in the work itself ; a very large proportion said, " I like children" and a few, " I like looking after people who are ill." Girls planning to become *hairdressers* stressed its future prospects, by which they usually meant the opportunity of setting up in business on their own. Prospective *dressmakers* were most interested in the usefulness of the trade, and least in working companions. Girls choosing *farming* usually gave as their reasons either a wish to work in the country or an interest in animals ; no other reason was mentioned more than once. Other occupations were chosen too infrequently to show statistically significant variations in the type of reason given, but there are indications that girls choosing *factory work* were attracted mainly by the company of other girls. Interest in *domestic work* and the *Arts* was not significantly associated with any particular reason, many different occupations being included in these groups.

The reasons given did not vary markedly with the intelligence of the children, though there were significant tendencies for more intelligent *boys* to stress variety and excitement, and for less intelligent *girls* to stress working conditions. Otherwise, the tendency noted by Wilkins[12] for the more intelligent among young adults to stress long-term incentives was not found in this particular group of school children. Nevertheless, the fact that the reasons given vary with the type of occupation chosen, does indicate that the children had observed distinguishing features of the work, whether or not this consideration preceded the actual choice. Moreover, it can be seen that in most cases the reasons are *meaningfully* related to the occupations chosen. This section does, therefore, add to the impression of realism gained from the study of vocational choice by suggesting that many of the children not only chose appropriately, but gave appropriate reason for their choice.

IV.—Environmental factors associated with vocational choice.

(*a*) *The Influence of People.*

It has already been shown by the study of reasons and precipitating causes that the influence of relatives and friends was one of the most important factors in the formation of vocational choice. The children were also asked, " What is your father's occupation ? " and " What is, or was, your mother's occupation ? " Of the boys who answered the first question, 15·5 per cent. chose their father's occupation, and of the girls, 14 per cent. chose the occupation followed by either their father or their mother. In addition to these, some children chose work either similar to that of their parents, as, for example, the son of a plumber who wished to be a gas fitter ; or from the same broad industrial group, as, for example, the son of a bricklayer who wished to be a painter. If, in these cases, some measure of influence can be assumed, the proportion influenced by parents becomes 32·3 per cent. of the boys and 16 per cent. of the girls. It must not be overlooked, however, that there were eighty-seven boys who did not know their fathers' occupation and forty-three girls who did not know the occupation of either parent. Since it is reasonable to suppose that these children had not been influenced by the desire to copy their parents, the number influenced

should be correspondingly reduced. The proportion of the whole group choosing the parents' occupation would, therefore, be 13·4 per cent. of the boys and 13·1 per cent. of the girls. The proportion influenced in a wider sense would be 27·9 per cent. of the boys and 16·9 per cent. of the girls. In any case the numbers choosing occupations similar to those of their parents were considerably greater than would be obtained by random selection. The influence of the parent's occupation must, therefore, be considered as one of the most important of the many factors involved in vocational choice.

The fact that boys choosing the building industry were more likely than boys choosing other occupations to give as their reason the influence of some friend or relative* is supported by a study of the relationship between the parent's occupation and the type of occupation chosen. There was a significant tendency for family tradition to be a stronger influence on boys choosing the building industry and mechanical engineering. When asked about their parents' *wishes*, most of the children reported either indifference to, or agreement with, their own choice.

Facts about the influence of people obtained from other items on the second questionnaire are in keeping with the findings of Bradley[1] that family influences are the strongest of all personal influences. In answer to the two questions, "Do you know any one else who does the job you have chosen?" and, "Mention here any people, other than your parents, who have given you advice about your future career," there was on the whole a slight preponderance of relatives over non-relatives, although the persons mentioned most frequently as doing the job were young acquaintances. Of people reported as giving advice, the most influential relatives were uncles and aunts. Of non-relatives the most frequently mentioned were teachers and youth employment officers. Moreover, about half the girls and rather more than half the boys claimed to have followed the advice given by the person named. On the whole, this section suggests that relatives were slightly more influential than non-relatives, and that uncles were followed at least as often and perhaps oftener than fathers. Among acquaintances, near contemporaries showed the way, while educationists frequently gave advice to which the children did at least listen.

(*b*) *Influence of the School Curriculum on Vocational Choice.*

Reference has already been made to the interest in a favourite school subject as one of the factors in vocational choice. In the present study the school influences were also studied indirectly, first by examining variations in choice from school to school and secondly by relating the child's choice to his subject preferences and abilities. The former method revealed very little variation from school to school either in the appropriateness of choice or in the type of occupation preferred, but the relationship between vocational choice and attitudes to school subjects had interesting features. There were highly significant† tendencies for the choice of building trades, woodwork, clerical work, nursing and dressmaking to be associated with either interest in or ability for the appropriate school subjects. Boys choosing *woodwork* were more likely than other boys to mention woodwork as their favourite and best school subject. There was a slight tendency for boys choosing *engineering trades* to like English subjects less than other boys. Prospective *clerical workers* preferred and claimed to excel in academic subjects such as English and arithmetic rather than

* See above, Section III.

† In this and the following paragraph, a *slight* tendency means significance at the ·05 level; a *significant* tendency at ·01 level; 'highly significant' refers to an association obvious without calculation.

practical work. The same was true of boys choosing *journalism* and other arts, whereas those who wished to become *commercial artists* or *draughtsmen* usually preferred art. They did not, however, so frequently claim that art was their best subject. No other occupations chosen by the boys were significantly associated with school preferences or abilities.

Of the five most popular *girls'* occupations, *dressmaking* has the most obvious connection with a school subject; and it is not surprising that about two-thirds of the girls choosing this occupation mentioned needlework as their favourite subject. A slightly smaller number thought that they excelled in it. Choice of *office work* was significantly associated with both interest and ability in the academic school subjects, the most significant feature being skill in arithmetic. It will be remembered that girls choosing clerical work were on the average significantly more intelligent than the rest. They were less interested than other girls in art, needlework and domestic science. Girls choosing *nursing* were more interested in domestic science and less in art. Where girls chose one of the *Arts*, such as dancing, drama, drawing or writing as a career, it was perhaps to be expected that they would, in most cases, declare an interest in the corresponding school subject; it is interesting, however, that they did not always claim ability in it, except in the case of drawing. A similar tendency is apparent in girls choosing *domestic science*, though in the latter case the frequencies are too small for statistical analysis. Of the girls choosing *hairdressing*, rather a large number claimed to have most ability in one of the social science group of subjects, including Geography and History; but since this group was heterogeneous, little significance can be attached to this fact. Vocational choices which were not significantly associated with school preferences and abilities were *shop work*, *factory work* and *farming*.

As in the case of reasons given, the associations thus discovered between vocational choice and attitude to school subjects are such as to suggest a meaningful, possibly in some cases a causal, relationship. Two occupations in particular, woodwork and dressmaking, showed this relationship to a marked degree; and it is reasonable to suppose that boys and girls of only moderate attainment in formal school work should be led, by their experience of comparative success in practical work, to choose occupations of a similar nature. As a consequence, these two occupations were those in which interest exceeded availability. Between other occupations and school subjects there was a less obvious but still interesting connection; the strong active boys whose best subject was physical training, tended to choose building work which involves physical activity in the open air; whereas those whose skill was in writing and calculation, chose the more intellectual clerical occupations. Boys who had little interest in verbal skills chose to work with engines. There are obvious reasons for the school interests mentioned by girls choosing domestic science, journalism and dramatic arts; but it is equally good sense that clerical work should be chosen by girls who have comparative interest in and success with English and arithmetic. The connection between preference for nursing and interest in domestic subjects indicates once again that girls tend to ignore the intellectual requirements of this profession. That girls wishing to be nurses had interests associated with home-making is significant in view of the fact that the majority specified children's nursing as the desired occupation. It is hardly possible to decide from the data if interest in a school subject has predated and influenced the vocational choice, but this is very likely to be so in the case of those most closely associated with school subjects, since it has already been shown that interest in woodwork, clerical work, and, to a slightly lesser degree, dressmaking, did not arise until well into the secondary school period.

V.—Impressions gained from interviews.

Impressions gained from interviews with small numbers of children, 59 in all, can serve only to amplify and elucidate points already made; but, except in the case of a few inarticulate pupils, the projection method had the effect of removing restrictions on the expression of less realistic ambitions, and less acceptable motives. The early popularity of two occupations in particular was emphasised; of twenty-six boys interviewed, eighteen admitted, in response to a question, that they had wished to drive some vehicle usually a steam engine or bus; of thirty-three girls interviewed, thirty-one said they had wished to be nurses., twenty-one giving this information without prompting.

Every child interviewed was asked certain questions of the form, "Why do you think so many boys wish to be engine drivers?"* In discussing the everyday jobs to which they had been attracted, mainly before the age of eight, the boys usually referred to some trivial but attention catching feature such as "the clinking of the milk bottles." These vocational fancies clearly resembled play activities in which little children copy the doings of the adults they see around them. In discussing engine driving, however, the adolescent boys were able to understand its greater appeal; they described the attractions of speed, power and danger. One boy said, "The engine is very powerful, but the engine driver can control it." Another said, "When we are little our mothers tell us not to play with fire, and then we see the man on the engine doing it." The appeal of excitement and the adventure of travel seemed to have increased rather than diminished throughout the pre-adolescent period, and was the basis of the popularity of the Senior Service. Boys thought that by joining the Navy they would "see the world" and "get away." Discussion of this point led to the conclusion that the importance attached by the boys to "fresh air," and "working in the open," should not be taken at its face value. In most cases it seemed rather to be symbolic of a strong desire for independence. In other cases it was connected with the boys admiration for good health and physical prowess.† The appeal of farming was stated by several boys to be "It's a healthy life," and "It keeps you fit"; though others were attracted to the farmer's life through their interest in animals. Rejoicing in health and physical skill seemed also to enter into the interest in professional sport, although, on the whole, the boys thought this ambition to be so obvious as to require no explanation. "Fancy," said one boy, "being *paid* for playing." It seemed from the interviews that the control over powerful machines, the adventure of travel and the achievement of physical health and strength were motives which made a deep appeal to boys, and formed the basis of some enduring vocational interests. When these interests were abandoned or modified, it was not because they lost their appeal, but from practical considerations.

The interviews on the whole confirmed the impression that serious consideration of possible vocations began soon after entry to secondary school, although interest in professional sport, the Services and farming tended to persist alongside other more practical interests. In some cases, however, the boys indicated that they had been able to reach a compromise solution, like that of a boy who was planning to satisfy his interest in aviation by doing woodwork in an aircraft factory. Several boys were able to describe how their early interest in driving engines and cars had developed to a general interest in engineering, as if the wish to control something powerful had developed in a subtler way. The boys thought that the main appeal of electricity was to

* Thus continuing the use of the projection method *after* story completion.

† Perhaps another aspect of the respect for power which was the basis of the interest in engines.

curiosity. It seemed magic, and they would like to know how it worked. One boy described how " the lights might go out ; you might be the only one who knew how to mend a fuse." Two boys said that electricity was " something modern " and another described it as " the career of the future." One boy remarked that ' electrician ' sounded important. About the popularity of woodwork there was little doubt. Most boys said that it was the most popular school subject, and they felt they would be able to do it. Some said that they were interested in using the tools. Of the boys interviewed, only two liked clerical work and both of these said that they were good at arithmetic and that their parents wanted them to work in offices. The other boys thought that they had had enough of pen-pushing. They disliked the idea of being ' cooped-up ' and " having to sit still all day."

The vocational interests of the girls, as revealed by the interviews, seemed to have developed in less clear stages, and their very early interests to have been more restricted than those of the boys. Those who discussed the early interest in *teaching* and *nursing* often, like the boys, stressed trivial aspects of the work, such as wearing the nurse's cap or marking the register. In this way early interest in these occupations resembled the very early interests of the boys in everyday activities. Where the serious wish to be a teacher persisted, each girl connected it with admiration or affection for some particular teacher. The girls thought that serious interest in nursing arose out of a wish to be like mother and look after the children. Most girls mentioned having had at some time, usually after the age of nine, wished to become ballet dancers, opera singers and film stars. Where boys wished to be admired for strength and skill the girls wished to be admired for their beauty. One of the attractions of the work of the *air hostess* was not only that she was able to travel about ; but that she wore a becoming uniform and was constantly on show. Pre-occupation with their personal appearance also seemed to be connected with the girls' interests in *dressmaking* and *hairdressing* ; and for plans to work in gown *shops*, particularly as mannequins. Similarly, one of the reasons for the general acceptability of *clerical work* was that it enabled a girl to dress nicely and keep herself clean and attractive. On reaching the secondary school stage, the girls seem to have turned their minds to the consideration of suitable and respectable occupations, while still maintaining a parallel interest in various forms of artistic expression. The occupation generally considered to be most ' suitable for girls ' was office work, whereas factory work was ' not very nice ' and was ' more for boys.' Parents' approval was quoted more often in connection with office work than other occupations. Several girls said that factory workers were ' looked down upon ' whereas office girls were respected and ' could get on in the world.' Work in a shop was also ' suitable ' particularly in drapers, florists and gown shops. They also liked the idea of serving people and being polite and helpful. A similar point was made with reference to the attraction of the telephonist's job. One girl said, " You have to learn to be patient, even when people are rude to you," and another, " It teaches you to speak nicely." One girl said, " It sounds good to say, ' I am a telephonist,' instead of just saying, ' I work in a shop.' It's not so ordinary." There was no sign that any of these occupations, in which interest had appeared mainly at the secondary stage, made a very deep appeal to the girls. Social conformity and prestige seemed to be the dominant motives for their selection.

VI.—DISCUSSION.

The present investigation has confirmed the findings of earlier research that there is a genetic development in vocational interest ; and the group studied seemed to have passed through four stages :

(1) Just as the very young child plays at being grown up, he may ' fancy ' the occupation of any familiar adult. For this reason the vocational interests of little girls will generally be more restricted than those of the boys, since the girls play at being mother or teacher. It is possible that older dull children of very poor social background and educational experience might never progress beyond this stage. The vocational choices of such children might be ' appropriate ' but could not be called genuinely realistic.

(2) Widening experience brings children knowledge of a variety of occupations which make a deeper and more lasting appeal. Occupations appealing especially to boys are those involving adventure and a sense of power ; those appealing to girls often involve identification with a mother figure or opportunities for self-display. The occupations which have ' glamour ' for pre-adolescent children are not necessarily in the highest professional grades, but are ambitious choices because many of them demand special talents.

(3) Further increase of experience and self-knowledge cause the children to modify or abandon their vocational fancies either because their attention has been drawn to less desirable features of the work, or else because it is seen to be unattainable. The ability to distinguish between reality and phantasy in vocational interest is evidence of maturity ; and there is little doubt that, once the child has progressed beyond the stage of copying the nearest adult, the ability to make a suitable choice of occupation *does* increase with age. There is some evidence that intelligence and satisfactory social and emotional adjustment contribute to this ability.

(4) The tendency in normal children is for vocational interests to change frequently and there are signs that young people only begin to give serious consideration to suitable careers after they have entered upon the final stage of education whatever that may be. It is not likely to be merely co-incidental that Ealing boys first thought of skilled manual work after the age of eleven, when they were transferred to the secondary modern school. If there is a general tendency for children to aim at the highest occupations available to their groups, the British system of segregating those of superior intelligence in grammar schools becomes automatically a form of vocational as well as educational guidance. Failure to gain admission to a grammar school is not, however, the only means by which children become aware of their own limitations as reasons for modification of their ambitions. Some girls mentioned, for example, lack of ability in English or arithmetic as a reason for changing their minds about office work. This fact suggests that the tendency for less intelligent children to choose lower grades of occupation is not solely due to the influence of home invironment.* One of the most important functions of education at the secondary stage should be to provide the child with the opportunity of making a realistic appraisal of his own abilities and disabilities, a task which too many teachers evade through an over-sensitive regard for the feelings of dull children. There is little doubt that the disproportionate popularity of woodwork and needlework is largely due to the comparative success which children experience in these school subjects. This is not necessarily because the children are all especially gifted in practical subjects, but because educational demands in these subjects are better adapted to the needs and abilities of the children.

When children have reached the stage of accepting that their vocational fancies cannot become serious vocational aims, many influences may combine to help them in their search for a suitable career. Some children appear to be

*See Part I. It is clear that at least two factors contribute to the correlation between intelligence and grade of occupation chosen.

able to make a compromise solution, by selecting an occupation with some relation to their former ambitions.* In most cases, however, the children, particularly the girls, have to make a new start, so that the formation of vocational choice becomes a very different process from indulgence in vocational phantasy. It is not possible, from the data at present available, to decide which solution, the compromise or the new departure, causes least frustration. It may well be that extravagant phantasy and modest plans may co-exist in the mind of the child without harmful effect.

Most of the vocational choices expressed by the children in the present investigation clearly represented serious intentions. In most cases they were of recent origin, and liable to change; sometimes alternative choices were mentioned. Frequent changes of choice are to be expected, even during this stage. The intensely held vocational ambition, persisting over many years in spite of obstacles, has been shown to be exceptional. Where such an ambition exists, it may be evidence of some unsatisfied emotional need, as was clearly the case with one of the girls interviewed. She had wished to be a kennel maid as long as she could remember and no other occupation would satisfy her. At the end of the discussion she said, "There was once a girl I liked, but she let me down. You can depend on animals more than on people." A similar psychological mechanism may sometimes account for the interest in nursing of some maladjusted girls. Although this profession is one demanding superior intelligence and emotional maturity, there is evidence that it is often chosen by girls slightly less intelligent and significantly less well-adjusted than other girls.

As a rule, the choice of vocation made by the normal child is not the result of a passionate interest, and occupational interest must be created. At this stage, the child will clearly be influenced by the occupations available in the neighbourhood and by the occupations of close friends or relatives. Unfortunately personal influence, where it leads to unsuitable choice, cannot be eliminated; although it is possible for children to be advised of its dangers by teachers and employment officers.

It has been shown, however, that there are other ways in which educationists may help to create vocational interests of an appropriate kind. Children in the present enquiry frequently mentioned how interest had been aroused by experience of an occupation, either by watching others engaged in it, or by trying out some similar work themselves. Some mentioned, for example, school subjects which have close similarity to occupations and others described visits to factories arranged by the Youth Employment Service. The vocational try-out is perhaps not equally practicable for all occupations, but some extension of practical work in schools is certainly possible. Already in boys' schools metalwork, engineering drawing and printing have supplemented the traditional woodwork. At this stage, particularly, many children seem to feel the need for a closer link between school and work. While there are still serious objections to narrow vocational training, and to curricula based on the early vocational interests of children, there can be no similar objection to a scheme for vocational education designed to introduce pupils to the immense variety of the nation's work. It might be possible to go even further and provide in the secondary modern school a liberalised technical education† for most of the pupils rather

* See above.

† This phrase was used by Professor Mace in speaking at a Conference on Selection for Secondary Education held by the Middlesex County Teachers' Association in the Institute of Education on 18th November, 1950. The talk has been reprinted in the Spring issue of *Educational Development*, 1951.

than for a small percentage taken out of the schools at the age of thirteen. Such a scheme might do much to remove the dissatisfaction felt at present by some pupils and their parents.

VII.—Summary.

By means of supervised questionnaires a study was made of the vocational preferences of boys and girls in the secondary modern schools of the borough of Ealing. The intelligence of the children, as measured by Moray House Advanced tests was taken into account. The following were the main conclusions :

1.—The children did not, on the whole, choose occupations from which they would be debarred on educational grounds. About 71 per cent. of the boys and 75 per cent. of the girls made reasonable choices in view of their intelligence.

2.—A tendency for the more intelligent children to choose from higher occupational grades was established by a significant correlation between the intelligence of the children and the intelligence requirements of their chosen occupations.

3.—The choices of the boys were fairly well in accordance with the industrial needs of the district except that too many boys wished to be carpenters and printers and too few clerical workers. Among the girls the choices most likely to lead to disappointment were nursing, hairdressing and dressmaking.

4.—A study of recollected earlier wishes showed frequent changes of vocational interest. Some early interests found by the children to be impractical continued to occupy the mind as phantasies alongside more serious vocational plans which, in most cases, had originated soon after the commencement of the secondary stage of education.

5.—Maturity in attitude to vocations was found to be assisted by normal intelligence and even more by satisfactory social and emotional adjustment.

6.—Important factors influencing vocational choice were : the parents' occupation ; the opinion and experiences of other relatives and acquaintances ; interest and success in relevant school subjects. ; the opportunity of seeing work done or trying it out. The last two mentioned suggest ways in which educationists can assist children in making suitable choice of occupation.

References

[1] Bradley, W. A. : " Correlates of Vocational Preference," *Gen. Psych. Mon.*, 28, 1943.
[2] Freeston, P. M. : " The Vocational Interests of Children," *Occup. Psych.*, XIII, 1939.
[3] Hawkins, A. D. : " Work of a Central School in Relation to the Future Occupations of its Pupils," M.Sc. Thesis, Birmingham, 1933.
[4] Hotoph, W. H. N. : " Some Characteristic Interests of Schoolboys," *Occup. Psych.*, XV, 1941.
[5] Lehman and Witty : " A Study of Vocational Attitudes and Intelligence," *Elem. School J.*, XXXI, 1931.
[6] Lingwood, J. : " The Vocational Information Possessed by Secondary School Girls," *Occup. Psych.*, XV, 1940.
[7] MacKaye, D. L. : " Fixation of Vocational Interest," *Amer. J. of Sociology*, XXXIII, 1927.
[8] Menger, C. : *Significance of Vocational Choices of School-children* (New York : Privately printed, 1932).
[9] Stephen, J. L. : " Occupational Interests in Relation to Intelligence," M.A. Thesis, London, 1938.
[10] Stott, M. B. : " A Preliminary Experiment in Occupational Analysis of Secretarial Work," *J. App. Psych.*, XIX, 1935.
[11] Valentine and Ritchie : " Reasons for Choice of Occupation Among Secondary School Pupils," *Forum of Education*, V, 1927.
[12] Wilkins, L. T. : " Incentives and the Young Worker," *Occup. Psych.*, XXIII, 1949.

ACKNOWLEDGMENTS.

This investigation could not have been carried out without the willing co-operation of many people. I am particularly indebted to: Mr. J. Compton, Borough Education Officer, Ealing; the Head Teachers and staffs of the secondary modern schools of the Borough; Miss C. E. Lewis, Educational Psychologist; Miss M. Walker and Miss I. Wood, Youth Employment Officers; Mr. Alec Rodger, Dr. R. Cockett, and Lt.-Col. Lakin for advice about intelligence requirements for the Services; Mrs. P. Thacker for the drawings used in the projection test; Miss B. Jamieson for help in recording the paired comparisons, and Miss M. A. Rose for other valuable assistance; Mr. R. J. Bartlett for advice on the use of statistical techniques; and finally Professor C. A. Mace, who suggested and supervised the investigation.

THE VALUE OF PICTORIAL ILLUSTRATION

By MAGDALEN D. VERNON

(*From the University of Reading*).

I.—*Introduction.* II.—*Experimental procedure*: (1) *series* 1; (2) *series* 2. III.—*Results*: (1) *the effect of illustrations on the remembering of the verbal material*; (2) *other effects of illustrations*; (3) *the comprehension of the verbal material.* IV.—*Conclusions.* V.—*Summary.*

I.—Introduction.

Investigations were described by the author in earlier publications[1] which showed that the ability to understand and remember the content of a written text was by no means always facilitated if the text was accompanied by graphs or charts. When the graphical material related directly to the facts described in the text, these facts were sometimes more clearly remembered. But this very emphasis on specific points was liable to interfere with the subjects' understanding of the general argument of the text. The result was a string of disconnected and sometimes contradictory statements. If the graphical data were illustrative in a general way and did not relate exactly to any particular fact presented in the text, the subjects tended to become confused because they were unable to co-ordinate the graphically presented data with the content of the text.

Somewhat similar problems would appear to arise when a verbal text is illustrated by pictures. Here we should distinguish between the presentation of information pictorially, as for instance in the anatomical drawings of plants and animals in biological text-books; and the use of pictures as an accompaniment to the verbal content. In the latter case the usual aim is to make the verbal information more interesting, more vivid and more thought compelling. Thus, the reader may be helped to understand and encouraged to remember what is stated in the text. But, on the other hand, it is possible that his attention might be distracted by the pictures from what he was reading, so that he remembered less well. It seemed a matter of some interest to investigate which effect was most likely to occur.

It must, of course, be recognized that the effect of pictorial material upon the reader varies greatly with age, intelligence and education. The younger and less intelligent child is likely to pay relatively more attention to pictures than is the older and more sophisticated reader. It would probably be useless to expect younger children to study books without pictures. The only question that arises is as to the best type of picture; and it is hoped to study this problem in future. The present enquiry was confined to boys and girls of fifteen and upwards, some of them at grammar schools and some at a modern school. For such children pictorial illustration is not essential, and its value is more doubtful.

Two questions must be answered. Firstly, do pictures help or hinder the acquisition of knowledge from the text? And secondly, do they increase interest to any appreciable extent? Thus, it might be that even if in an experimental situation they did little to assist the acquisition of information, yet in an uncontrolled situation they might stimulate the reader to study a book or an article which he would otherwise have ignored. Furthermore, the pictures might

[1] *Brit. J. Educ. Psych* (1950), XX, 174; ; and *Quart. J. Exper. Psych.* (1951), III, 19.

encourage him to take an active and thoughtful interest in the topic presented, whereas the verbal text alone would have left him unmoved. Some evidence on these points was obtained by inviting the readers' comments on the verbal material and illustrations; and also by questioning them as to what actions were suggested to them as a possible outcome of the situations described in the text.

II.—EXPERIMENTAL PROCEDURE.

(1) *Series* 1.

Two series of experiments were carried out. In the first, two versions were prepared, each of two short articles of 700-800 words: A, dealing with the causes and cure of tuberculosis; and B, on the causes of illness in young children. The first versions (A1 and B1) were written in popular style, and each was illustrated by four rather striking photographs of, for instance, living conditions in the slums. The second versions (A2 and B2) were written more objectively and scientifically, and were accompanied by graphs showing data on disease, mortality, etc.

Half the subjects were given A1 and B2 to read, and the other half, A2 and B1. After studying each of these for 10 minutes, the subject was required to recall orally what it was about; and his report was recorded verbatim. He was then asked (after A): "What can you think of that might be done to prevent or remedy this disease?" (After B): "What do you think might be done to prevent or remedy these conditions?" Finally, he was asked which of the two articles he found the more interesting; whether the pictures or graphs seemed to make any difference; and if he had recently come across anything of this kind before.

The subjects of this series of experiments were fourteen boys and twenty-four girls from grammar schools; the boys were aged 17½—18., the girls, 16—17½. Their reports were scored firstly for the number of major points remembered, and secondly for the number of details. This latter score was calculated by dividing the text up into units of thought, and scoring one point for each unit recalled. The reports were also graded A, B, C, or D, for their general coherence and logical consistency.

(2) *Series* 2.

This series was carried out in order to compare the amount remembered with and without pictorial illustration. The texts were the same as those of A1 and B1—namely, the popular versions. A3 and B3 were identical with A1 and A2, containing the same illustrations; A4 and B4 had no illustrations of any kind. The conditions of experiment and the methods of scoring were the same as in Series 1. But, in order to economize time, the questions on prevention and remedy were omitted.

The subjects were twenty-four boys and girls, aged 15—16 from a modern school. This was a selective central school, and these boys and girls were, in the main, staying on at school until they could take the G.C.E. Thus they were superior in education and intelligence to the normal run of modern school pupils.

III.—RESULTS.

(1) *The effect of illustrations on the remembering of the verbal material.*

The numbers of points recalled differed somewhat between the two half-groups. Thus, the number for each half-group was averaged, and the number in the pictorial and non-pictorial versions percentaged on these averages. It

will be seen from Table I that the differences between the pictorial and non-pictorial versions were small for both series of experiments. For the boys in Series 1 there was a slight advantage on major points for the pictorial versions, but this difference was not significant at the 5 per cent. level.

TABLE I

	Major Points Recalled, as per cent. of Average		
	Series 1—Boys	Series 1—Girls	Series 2
Pictorial	106·1	98·6	98·1
Non-Pictorial	93·8	101·3	101·9
	Details Recalled, as per cent. of Average.		
Pictorial	97·9	98·1	98·1
Non-Pictorial	102·4	102·2	101·9

Thus, the versions illustrated by pictures were not remembered significantly better than those without pictures, or even than those with graphs. However, it did appear that certain major points in the text directly illustrated by pictures were remembered better than those same points unillustrated by pictures. There were five of these points, and it may be seen from Table II that in almost every case they were remembered in a higher percentage of cases from the pictorial versions. The average figures were 87·4 for the pictorial versions, 69·3 for the non-pictorial ; the difference, 18·1, was significant at the 1 per cent. level. Thus, the remainder of the major points must have been less well remembered in the pictorial versions. Perhaps the pictures laid undue emphasis on certain points, and therefore, distracted attention from the rest of the text.

TABLE II

	Per cent. of cases remembering points				
	1	2	3	4	5
			Series 1—Boys		
Pictorial	100	100	86	100	75
Non-Pictorial	86	86	57	86	75
			Series 1—Girls		
Pictorial	100	92	75	83	75
Non-Pictorial	83	100	50	67	50
			Series 2		
Pictorial	92	83	75	100	75
Non-Pictorial	83	42	75	67	33

One or two subjects mentioned that they found the pictures rather distracting. Two of the major points, one in A and one in B, which were definitely less well remembered from the pictorial version, occurred at a turn over from one page to the next. In each case there was a picture between the two pages. It seems possible that the picture attracted attention here and interrupted the sequence

of thought from one page to the next, so that this part of the text was less well remembered.

There were also a few cases in which the inclusion of a graph seemed to emphasize a major point so that it was better remembered from the version accompanied by graphs than from the pictorial version, which laid no special emphasis on it. Thus, one graph showed in quite a striking manner that the death-rate was much higher among infants and old people than at the intermediate age ranges. Another showed the decrease of infant mortality in the last sixty years. Both these points were better remembered from the version accompanied by graphs. On the other hand, there were other graphs which seemed to have little effect of this kind.

It did not appear that the inclusion of pictures affected the general coherence of the reports on the pictorial versions. This effect might not have been expected in Series 1, since the graphs might have affected coherence in the same way as the pictures. Indeed, such an effect was shown to occur in the previous publications cited above. But even in Series 2, there was no significant difference between the grades obtained on the reports of the pictorial and non-pictorial versions (see Table III). Thus, although the pictures may weight some part at the expense of others, their effect upon a coherent recall of the whole was neither favourable nor unfavourable.

TABLE III

	Per Cent. of Reports Graded											
	Series I—Boys				Series 1—Girls				Series 2			
	A	B	C	D	A	B	C	D	A	B	C	D
Pictorial	21	50	29	0	17	33	33	17	8	33	29	29
Non-Pictorial	21	50	21	7	4	42	42	12	8	21	50	21

(2) *Other effects of illustrations.*

It was suggested in the INTRODUCTION that even if the pictures had little effect on the remembering of the verbal material, they might, nevertheless, have some emotional impact on the subjects, and affect their attitudes towards the social problems described. It was hoped to obtain some indication of this from the suggestions made as to how the conditions could be remedied. In fact, it did appear that certain types of suggestion were more frequently given after reading the pictorial versions than after the non-pictorial ones. There was a slightly larger number of suggestions per subject for the pictorial versions taken as a whole : 5·4 to 4·9 among the boys of Series 1, and 4·5 to 3·8 among the girls. But the greater part of this excess was produced by suggestions relating to the relief of poverty and its effects. These included : Better wages, slum clearance and improved housing, better food and clothing, better working conditions. There were 3·9 suggestions per subject of this type after reading the pictorial version, and 2·3 per subject after reading the non-pictorial version. The only other suggestion which showed much difference for the two versions was that as to the desirability of educating mothers in child care. This was also put forward considerably more frequently by those who read the pictorial version. This may have been due partly to the pictures, and partly to the fact that the text of the pictorial version commented particularly on the effects of ignorance of child care.

There was little doubt that the pictures did create a considerable impression in many of the subjects as to the evils of slum housing. Six of the eight pictures related to this topic. Fifty-seven per cent. of the subjects definitely found the pictures to be interesting, and several commented that they showed you what slum conditions were really like. Suggestions as to the importance of town planning and slum clearance were made eagerly and with vehemence. It is interesting to contrast the emotional effects of these pictures with the slight effect produced by a picture of an X-ray photograph of the lung infected with tuberculosis. That an X-ray photograph is the only certain means of making an early diagnosis of tuberculosis was remembered by 79 per cent. of those who saw the picture, and only 59 per cent. of those who did not. But, when it came to making suggestions for preventing and curing tuberculosis, the value of mass radiography was mentioned by 37 per cent. of those who saw the photograph, as against 53 per cent. of those who did not. Thus, the impression created by the picture was not effective in stimulating the subjects to think : " Value of X-ray, therefore importance of mass-radiography."[1]

It has been found also in the study of propaganda that it is relatively easy to arouse indignation against evils for which one is not responsible, condemnation of those who might have been responsible, and suggestions for making " someone do something about it."[2] But it is much harder to persuade people to do " something about it " themselves—or even to contemplate so doing. The emphasis laid by these articles on the evils of poverty made a ready emotional appeal to the subjects, but did not seem to have so much effect in stimulating them to think the problems out. We shall now consider further evidence on this point.

(3) *The comprehension of the verbal material.*

Perhaps the most interesting results of these experiments related not to the value of pictorial illustration, but to the numerous failures in understanding the material read, and to the misconceptions that arose. It was anticipated that the A2 and B2 versions in Series 1, those illustrated with graphs, might be found somewhat ' tough ' reading. We saw, however, in Table III that the grades obtained for the two versions in Series 1 were much the same. But, apparently, even the ' popular ' text of A1 and B1 was too difficult for 17 per cent. of the girls in Series 1 and for 25 per cent. of the boys and girls in Series 2.[2] Their reports, graded D, were scrappy, incoherent and sometimes grossly inaccurate. It appeared that these boys and girls had not gained any coherent general idea of what the articles were about, and thus produced a series of disconnected statements. No attempt was made to relate these in any logical sequence ; and, indeed, they were sometimes completely contradictory. Thus, there was a statement in the text of A : " There are still some diseases for which there is no certain method of prevention and no certain method of cure. Of these, one of the most deadly is tuberculosis." This was reproduced in several cases as : " Tuberculosis is a disease for which there is no prevention and no cure." Yet, shortly afterwards (once, in the next sentence) the subjects would proceed to describe how it could be cured. Again, in one part of the report, it would be stated that the drug BCG could be used for innoculation, to produce temporary

[1] These subjects were perfectly familiar with mass-radiography, which had indeed been carried out at their schools not very long before.

[2] See, for instance, the chapter by Lazarsfeld and Knupfer on " Communications Research and International Co-operation," in *The Science of Man in the World Crisis*, edited by R. I. Linton (1945).

[3] The performances of the boys in Series 1 were rather better than those of the girls because they were older and had done at least a year more of sixth form work.

immunity ; in another place it was mentioned as a cure. One boy stated that " there were two ways of curing tuberculosis, by vaccination and by inoculation." This type of confusion was scarcely ever found among the grammar school children, although some of their reports showed some incoherence.

It was found fairly generally that factual statements, especially those which were simple and striking, were better remembered than were statements which related and explained phenomena described in the factual statements. There were, in particular, four factual statements and four corresponding explanatory statements : The first two pointed out that tuberculosis was more common among the poor than among the well-to-do : (1.a) the poor do not have sufficient good food, therefore (1.b) their resistance is low, and (2.a) they live in overcrowded conditions, hence (2.b) the germs of tuberculosis are highly concentrated which makes the risk of infection greater. The other two statements dealt with children's diseases. One (3.a) was that the number of deaths of infants was higher among the lower classes than among the higher classes ; (3.b) that they did not necessarily catch more diseases, but were more likely to die of them if they caught them. The other (4.a) was that babies catch cold very easily ; but that (4.b) if they are kept warm this need not happen, as is seen from the low death-rate of the Scandinavian countries. It will be seen from Table IV

TABLE IV

	Per cent. of Statements Reported Correctly.						
	Series 1		Series 2		Series 1		Series 2
	Boys	Girls			Boys	Girls	
1.a	100	100	92	1.b	14	8	50
2.a	100	92	83	2.b	57	0	33
3.a	100	92	83	3.b	29	42	25
4.a	100	83	92	4.b	43	58	50

that in every case the factual statements (*a*) were far better remembered than the explanatory statements (*b*). Now the explanatory statements 1.b and 2.b contain points of quite fundamental importance to the general argument of the first article—namely, the relationship of the spread of tuberculosis to high concentration of germs, and to low powers of resistance to them. Those who omitted these statements cannot really have understood the argument of this part of the article, though they may have been emotionally impressed by the fact that a high incidence of the disease was related to poverty. The misunderstanding was further shown in remarks such as : " They should have good holidays to get away and get fresh air " ; " More men get tuberculosis because they work their lungs harder, therefore, they are weaker and have less resistance ; " " Houses should be purged of tuberculosis " (though it was stated in the text that tuberculosis germs are carried in the breath).

IV.—CONCLUSIONS.

These results substantiate the conclusions reached in one of the previous publications,[1] that isolated phrases may be assimilated and remembered, sometimes fairly correctly, but sometimes with slight changes in them that completely alter their meaning. There was a tendency, especially among the less

[1] *Quart. J. Exper. Psychol.* (1951), III, 19.

intelligent subjects, to remember facts in isolation, rather than the explanatory and relational statements, and the result was a failure to grasp the fundamental argument. In the process of remembering and reproducing the content, the factual statements which had been assimilated were produced higgledy-piggledy, without relation to one another, and sometimes in direct contradiction. But since the subject did not perceive the inter-relationship between them, he was unaware of this contradiction.

It is clear that pictures are still less able than are graphs to demonstrate relations and explanations. They might indeed be expected to over-emphasize particular statements of fact. But, the explanatory statements quoted above were about equally well remembered from the pictorial and the non-pictorial versions. Thus it seems that the pictures had little effect one way or the other in helping the reader to gain a real understanding of what he read. Even if they heightened interest in certain parts of the articles, this increased interest did not lead to increased general understanding. The first article, on tuberculosis, was thought by 69 per cent. of the subjects to be more interesting than the second, on children's diseases; only 15 per cent. thought the second article more interesting. Yet, Table V shows that the second article produced better

TABLE V

	Per Cent. Reports Graded			
	A	B	C	D
Article A.....	10	32	39	19
Article B.....	19	42	23	16

reports; the difference is significant at the 5 per cent. level. Though interesting pictures might stimulate people to read articles which they would not otherwise look at, there is no guarantee that they will understand such articles or remember them correctly. Indeed, their recollections may be incredibly garbled.

It may be argued that to force anyone to give a verbal account of something they have read is to create an artificial situation, and that people can often remember things they cannot formulate clearly. Lack of facility in verbal formulation might account for some of the incoherence of the reports; but would it be responsible for complete mis-statements, and for the failure to grasp reasons and explanations? Is it possible that, at a certain level of intelligence and maturity of thought, people are not really interested in finding the exact reasons and causes of phenomena? The phenomena, the facts, are interesting in themselves, especially if they are sensational, emotionally exciting. Disease always appeals to emotional interest, and the association of disease with poverty is so obvious that it is immediately accepted. Few people may care to try and track the exact chain of cause and effect between poverty and any particular disease, or pay much attention to its other causes. This is comprehensible when these causes are not at all clear, and when difficult and complex processes such as immunization are involved. But it does seem important to recognize that many people have no interest in seeking for the fundamental causes of events, and are easily satisfied with the most plausible and superficial of explanations.

Yet it is one of the functions of education to induce the effort to relate phenomena together, to follow the sequence of cause and effect, rather than just to accept facts as they stand without checking their importance or con-

sistency. If, as seems probable, people do not do this themselves until they have reached a certain stage of intellectual development, they may perhaps be helped by stressing the relational statements of the written text. Greater emphasis might be laid upon the comparison of facts, to observe if they are consistent or contradictory; whether their causal relations are clear, which hypotheses are proven, and which require further data for proof or disproof.

V.—SUMMARY.

1.—Two series of experiments were carried out, on boys and girls between 15 and 19 years of age, to investigate the effect of accompanying pictorial illustrations upon the remembering of verbal texts.

2.—It was found that older boys and girls were sometimes helped by pictures to remember the particular facts demonstrated by the pictures; but that, taking the verbal material as a whole, an illustrated version was remembered no better than an un-illustrated one, or than one accompanied by graphs.

3.—In several cases, the pictures produced a considerable emotional impact, such as might affect the attitudes of the subjects to the social problems described in the text. But it could not be concluded that these attitudes would lead to reasonable suggestions for courses of action.

4.—In fact, reasonable judgment about the social problems would have been difficult in many cases, because the subjects did not attempt to understand the problems. They accepted the more striking facts presented in an uncritical manner, and ignored explanations and statements about the causes of these phenomena.

My thanks are due to the head masters and head mistresses who so kindly made the arrangements for me to carry out these experiments; and to the boys and girls who acted as subjects in them.

SOME EDUCATIONAL INFLUENCES ON THE CHOICE OF A SCIENCE CAREER BY GRAMMAR SCHOOL GIRLS

By NORA M. BROWN
(*Lecturer in Education, Sheffield University*).

I.—*Introduction.* II.—*Data and method of procedure.* III.—*The survey* : (*a*) *occupations and chosen careers* ; (*b*) *L.E.A. entrance examination results* ; (*c*) *the number of science subjects taken in the S.C. examination* ; (*d*) *different combinations of science subjects taken in the S.C. examination* ; (*e*) *success in science subjects taken in the S.C. examination* ; (*f*) *success in all subjects taken in the S.C. examination* ; (*g*) *the schools' estimate of ability for advanced work in various groups of subjects* ; (*h*) *comparison of the ability estimates with S.C. results* ; (*i*) *fathers' occupations.* IV.—*Summary and conclusions.*

I.—Introduction.

This investigation was made in view of the increasing shortage of women Science teachers. The effects of the shortage have already been felt in many schools where, for instance, the time devoted to Science has been decreased or where some or all branches of Science are no longer taught. Such retrogressive measures give cause for concern at a time when the claims of Science for inclusion in the curriculum are stronger than they have ever been.

The intention of this paper is to throw light upon some educational factors which may influence grammar school girls in their choice of career and, by implication, to suggest how these influences might be used to increase the number of girls taking up scientific careers.

II.—Data and method of procedure.

The 705 girls from twelve grammar schools[1] in Sheffield and the surrounding district who took the School Certificate examination of the Northern Universities Joint Matriculation Board at Midsummer, 1947, provided the data for the investigation.

Information was obtained from the following five sources :

(1) Individual questionnaires :

(*a*) For those who left school after taking the S.C. examination. These were sent to the girls at their home addresses during November, 1947. The questions were designed to find out (i) why the girl left school ; (ii) her occupation ; (iii) whether she was satisfied with it ; (iv) what occupation she would have preferred ; (v) why the preferred occupation was not possible.

(*b*) For those who (i) followed a full H.S.C. course in the Sixth Form, or (ii) took a general course in the Sixth Form. These were administered at the schools between March and June, 1948. Each girl was asked to state (i) her course of study ; (ii) the reasons for her choice of subjects ; (iii) the reasons why she did not take a Science course (where appropriate) ; (iv) her chosen career.

(2) Supplementary data from the twelve schools, including the types of Science courses offered, the available teaching force, and changes in the girls' occupations or choice of career.

[1] The schools are numbered 1–12 ; Schools 1–4 and 7–10 are girls' schools and Schools 5, 6, 11, 12 are co-educational schools.

(3) Local education authority entrance examination results for the girls involved.

(4) Northern Universities Joint Matriculation Board School Certificate and Higher School Certificate results.

(5) Data from the training colleges where some of the girls followed a teachers' training course after leaving school.

The influence of the following factors upon the number of girls taking up a Science career was investigated :

(1) L.E.A. entrance examination results (Intelligence, English and Arithmetic quotients).

(2) Number of Science subjects taken in the S.C. examination.

(3) Different combinations of Science subjects taken in the S.C. examination.

(4) Success in Science subjects taken in the S.C. examination as denoted by marks of 50 per cent. or over.

(5) Success in all subjects taken in the S.C. examination as denoted by marks of 50 per cent. or over.

(6) The schools' estimate of ability for advanced work (i.e., a H.S.C. course) in various groups of subjects.

(7) The fathers' occupations.

In comparing percentages, a difference was regarded as significant if it exceeded twice its standard error. Using the " t " test, differences between means were taken as significant at the 5 per cent. level.

III.—THE SURVEY.

(*a*) *Occupations and chosen careers.*

Throughout this paper, ' Science ' is taken to mean Physics, Chemistry or Biology or any combination of these three. A Science career is one in which Science forms part of the training or for which a knowledge of Science is required. All other careers are termed non-Science careers.

The occupations and careers of 681 girls were ascertained. Of these 141 (20·7 per cent.) were scientific. Details of the numbers and percentages of girls taking up the different kinds of Science and non-Science careers are shown in Table I.

TABLE I

Science Careers	No.	%	Non-Science Careers	No.	%
Nursing	42	6·2	Office Work	288	42·3
Laboratory Technology	33	4·9	Teaching with T.C. train'g	150	22·0
Domestic Science	25	3·7	University degree in Arts Faculty	35	5·1
University Degree in Science Faculty	16	2·3	Music, Art, Drama	17	2·5
Physiotherapy, Radio-therapy, etc.	12	1·8	Shop Assistants	15	2·2
Physical Education	5	·7	Assistant Librarians	13	1·9
Agriculture, Horticulture	4	·6	Telephone Operators	8	1·2
Medicine, Veterinary work	4	·6	Dressmaking, Hairdressing	5	·7
			Cashiers, Receptionists	4	·6
			H.M. Forces	3	·4
			Social Service	2	·3

The group of office workers comprises girls who have had a training in shorthand and typing, either full-time at a commercial college, or part-time at evening classes, girls who have learned to operate a comptometer, clerks who have had no training at all, and girls who have passed Civil Service examinations.

Girls who entered training colleges have been classified as having taken up a non-Science career although there may be grounds for re-classifying several border-line cases, viz., twelve girls who took Biology, Gardening, Horticulture or Rural Studies to advanced standard at their training colleges, and for whom it might be claimed that there is a scientific element in their training. This has been borne in mind in making comparisons: such reclassification would not affect in any way the results given in this paper.

Although the overall percentage of girls taking up Science careers is 20·7, the percentages range from 36·8 in School 7, to 11·4 in School 6.

(*b*) *L.E.A. entrance examination results.*

The results used are those of the Sheffield Local Education Authority. Complete sets of figures were obtainable for 272 girls, of whom 51 took up Science careers and 221 took up non-Science careers. The means and standard deviations of the I.Q., E.Q., and A.Q. distributions for these two groups are given in Table II. The I.Q.s, E.Q.s and A.Q.s were obtained from Moray House tests.

TABLE II

	No. of girls	I.Q.		Eng.Q.		Arith.Q.	
		Mean	s.d.	Mean	s.d.	Mean	s.d.
Girls who took up Science careers	51	124·8	7·69	121·0	10·32	114·0	8·23
Girls who took up non-Science careers	221	122·9	7·12	118·9	10·16	110·6	8·17

Only the means of the A.Q. distributions show a statistically significant difference.

Two other points of interest emerge:

(1) No girl with an A.Q. of less than 102 took up a Science career although there were girls with A.Q.s as low as 90.

(2) The E.Q. distribution for girls taking up Science careers was bi-modal, while that for girls taking up non-Science careers was normal.

(*c*) *The number of Science subjects taken in the S.C. examination.*

Science careers were taken up more frequently by girls with two Science subjects than by girls with only one. In five of the schools the curriculum was so arranged that no girl could take more than one Science subject. This restriction involved 376 girls. The remaining 329 were offered two Science subjects, but only 114 (i.e. 34·7 per cent. of the 329) did, in fact, accept the offer. The rest chose alternative subjects or else took neither the Science subject nor the alternative.

The percentage of girls who took two Science subjects in the separate schools ranged from 67·5 in School 12, to 20·0 in School 2. The highest percentages occurred in two schools (6, 12) where the girls were not free to make the choice themselves and in the school (7) which offered the best opportunity for selecting two Science subjects. The alternative subject arrangement in this school was such that, even if a girl chose to take German or Domestic Subjects instead of Chemistry, she would still be able to take both Physics and Biology for which there were no alternatives. The lowest percentages were found in those schools (2, 4) which offered more than one non-Science subject as alternatives to a Science subject, e.g., Art or German as alternatives to Chemistry.

Table III gives the number of girls, in those schools where there was freedom of choice, who rejected various Science subjects and took the alternatives offered. Ninety girls rejected both the Science subject and its alternative. Physics was the most rejected Science subject.

TABLE III

No. of girls taking the various alternative subjects offered.	No. of girls rejecting Science subjects		
	Chemistry	Physics	G.Sc. II
Art 44	44	—	—
Domestic Subjects 67	27	40	—
German 15	15	—	—
Latin 17	—	5	12
Music 14	—	14	—
Scripture 10	—	10	—
TOTAL ..	86 (69·9%)	69 (85·2%)	12 (40·0%)

(*d*) *Different combinations of Science subjects taken in the S.C. examination.*

Table IV gives a list of these combinations and the number of individuals taking each one. There was no statistically significant difference between the percentages of girls with the different combinations who took up a Science career.

TABLE IV

Combinations of Science subjects	No. of girls taking each combination
Physics and Chemistry	37
General Science I and II	36
Chemistry and Biology	27
Physics and Biology	14

(*e*) *Success in Science subjects taken in the S.C. examination.*

For each subject in this examination a grade representing the candidate's success is given. In 1947 a Very Good was awarded for a percentage of 70 or over, a Credit for a percentage within the range 50–69, a Pass for a percentage between 30 and 49, and a Failure for a percentage below 30.

A greater proportion of marks of 50 per cent. and over[1] in Science subjects was gained by girls who took up Science careers than by girls who took up non-Science careers. Table V, Section (b) shows that this result is due almost entirely to the successes of girls who took two Science subjects.

The twelve schools show differences in their percentages of successes ranging from 77·9 in School 4 to 3·4 in School 5. The four co-educational schools are among those showing the lowest percentages, two of them being those schools where less freedom was given to the girls in the selection of their Science subjects. The other school with a low percentage is known to receive

[1] 50 per cent. was chosen as the border-line mark because it was the most convenient percentage known to have been standardised by the N.U.J.M.B., the other two standardised marks being 70 per cent. and 30 per cent. In the rest of this paper 'success in a subject in the S.C. examination' will be taken to mean the achievement of a mark of 50 per cent. or over.

TABLE V

	Marks in S.C. Science subjects gained by girls who took up a Science career		
		No.	%
(*a*)	Total No. of Marks of 50% and over	115	28·7
	Total No. of marks of under 50%	64	17·7 D.S.
(*b*)	50% and over in 2 subjects	23	62·2
	Under 50% in 2 subjects	7	18·4 D.S.
	.....	.....	.....
	50% and over in 1 subject	69	21·1
	Under 50% in 1 subject	50	17·5 D.N.S.

D.S.—Difference significant. D.N.S.—Difference not significant.

less intelligent children than some of the other schools. In the school with the highest percentage of successes the girls were graded according to their ability in both Arts and Science subjects and there were separate Arts and Science classes in the S.C. year.

(*f*) *Success in all subjects taken in the S.C. examination.*

Girls who took up Science careers gained a significantly greater proportion of marks of 50 per cent. and over in all their S.C. subjects, than girls who took up non-Science careers.

TABLE VI

Marks in all S.C. subjects gained by girls who took up Science careers		
	No.	%
Total No. of marks of 50% and over	662	22·2
Total No. of marks under 50%	487	18·7 D.S.

(*g*) *The schools' estimate of ability for advanced work in various groups of subjects.*

The Head Masters and Head Mistresses were asked to put their girls into four categories :

(i) Those able to do Higher School Certificate work in Arts subjects.
(ii) Those able to do H.S.C. work in Science subjects.
(iii) Those able to do H.S.C. work in both groups of subjects.
(iv) Those not capable of H.S.C. work in either group of subjects.

Table VII shows the proportion of those in each category who took up Science careers. No information was obtained from School 11.

37·5 per cent. of the girls who were put in category B did not take up Science careers. On the other hand, Science careers were taken up by a larger proportion of those in category C than might have been expected from the overall ratio, for the whole group of 681, of 1 Science career to 4 non-Science careers.

TABLE VII

Categories of ability for advanced work	Girls taking up a Science career	
	No.	%
A.—Arts subjects only	17	10·9
B.—Science subjects only	15	62·5
C.—Both groups of subjects	25	48·1
D.—Neither group of subjects	79	18·9

The total number of girls in each school estimated as able to do advanced work in Science subjects was calculated by adding the number of individuals in category B to half the number in category C. There was a good deal of variation from school to school in the percentage of these girls, ranging from 44·1 in School 7 to 4·3 in School 10.

The Head Master and Head Mistresses of three of the four schools giving the highest percentages were scientists themselves. In three of the schools it was possible for the girls to take two Science subjects in the S.C. examination and in one school there was a tendency towards early specialisation by a division of the girls into Arts and Science classes. In three of the four schools giving the lowest percentages the girls could take only one Science subject in the S.C. examination.

(*h*) *Comparison of the ability estimates with S.C. results.*

Two points of interest emerge :

(1) The schools estimated only 24 girls as able to do advanced work in Science subjects only, as compared with 159 in Arts subjects only. Yet there was no evidence from the S.C. results that any girl, in a random sample of 90, showed a significant bias of ability towards either Arts or Science subjects.

(2) S.C. results indicate that Science careers were taken up by the abler girls. The schools' estimates do not give such an indication.

A third estimate of ability in Science subjects was given by some of the girls themselves. Lack of ability was cited as the reason for not taking a Science course in the Sixth Form by 74 girls out of a group of 135, Mathematics being given as the subject of greatest difficulty in 38 cases. Only 15 girls gave ability as the reason for taking specific Science subjects in the H.S.C. examination. All these girls gained marks of over 50 per cent. in the S.C. examination for the subjects concerned, but only five were estimated by their schools as able to do advanced work in Science subjects.

(*i*) *Fathers' occupations.*

This factor was investigated because it has been shown that there is correlation between the intelligence of children and their fathers' occupations.[1]

The occupations of 633 fathers were ascertained and were divided into two groups, Brainwork and Handwork. Occupations involving writing, teaching, managing, giving orders, or selling comprised the first group. Handwork consisted of making, mending, moving, growing or tending any kinds of goods.

The fathers of girls who took up Science careers were in more cases Brainworkers than the fathers of girls who took up non-Science careers.

Differences between the schools in the percentages of girls whose fathers are Brainworkers range from 78·6 in School 7 to 8·8 in School 11. Of the schools

[1] *e.g.* " The Social and Geographical Distribution of Intelligence in Northumberland," J. F. DUFF and G. H. THOMSON, *Brit. J. of Psych.*, October, 1923.

TABLE VIII

Fathers' occupations	Girls taking up a Science career	
	No.	%
Brainwork	82	28·8 D.S.
Handwork	51	14·7

showing high percentages there were three with fee-payers among their pupils. Of the four schools giving the lowest percentages three are mixed schools in outlying districts with pupils drawn mainly from the smaller scattered communities in the area. The fourth is the school with a comparatively less intelligent intake.

However, when the 633 girls whose fathers' occupations are known are divided into two groups according to these occupations and their abilities are compared, using the five ability estimates available, viz., I.Q., E.Q., and A.Q., at the age of 11+, success in S.C. examination subjects and the schools' ability estimates for advanced work, there is no evidence of a difference between the groups. It may be that the father's occupation in this case is effective as a social rather than as an educational factor.

IV.—Summary and conclusions.

The 705 girls who attended twelve grammar schools in Sheffield and the surrounding district and who took the S.C. examination of the N.U.J.M.B. at Midsummer, 1947, were used in the investigation.

The influence of the following factors upon the number of girls taking up a Science career was examined :

1.—L.E.A. entrance examination results, viz., (*a*) Intelligence Quotient ; (*b*) English Quotient ; (*c*) Arithmetic Quotient.

2.—Number of Science subjects taken in the S.C. examination.

3.—Different combinations of Science subjects taken in the S.C. examination.

4.—Success in Science subjects taken in the S.C. examination as denoted by marks of 50 per cent. or over.

5.—Success in all subjects taken in the S.C. examination as denoted by marks of 50 per cent. or over.

6.—The schools' estimate of ability for advanced work (i.e., a H.S.C. course) in various groups of subjects.

7.—The fathers' occupations.

Girls who took up Science careers,

(*a*) had higher A.Q.s,
(*b*) took more Science subjects in the S.C. examination,
(*c*) were more successful in Science subjects in the S.C. examination,
(*d*) were more successful in all subjects in the S.C. examination,
(*e*) were estimated more frequently by their schools as able to do advanced work in Science subjects only or in both Arts and Science subjects,
(*f*) more often had fathers who are Brainworkers,

than girls who took up non-Science careers.

Factors which appeared to have no influence upon the number of girls taking up Science careers were :

(*a*) I.Q., (*b*) E.Q., (*c*) different combinations of Science subjects taken in the S.C. examination.

Among the 12 schools No. 7 was exceptional inasmuch as the percentage of girls taking up Science careers differed significantly from the percentages in six other schools. School 7 also differed from these six schools in another respect : a significantly greater number of its pupils had fathers who are Brainworkers. The other influences varied in their effect from school to school.

Although the tests used to distinguish between genuine differences in percentages and means and chance differences are not strictly appropriate, since the groups compared were rarely homogeneous, they were useful as a rough guide to indicate which comparisons are worth further scrutiny. It is to be expected in a preliminary enquiry of this kind that the results will be indefinite and that any conclusions drawn must be only tentative. More intensive study of some of these factors in a wider field is essential.

ACKNOWLEDGMENT.—I am indebted to the University of Sheffield Research Grant Fund Committee for the financial help given to me during the course of this investigation.

A NOTE ON "AN EVALUATION OF REMEDIAL EDUCATION"

By M. L. KELLMER PRINGLE and R. GULLIFORD
(*University of Birmingham, Remedial Education Centre*).

We should like to comment on the article by Messrs. Curr and Gourlay on "An Evaluation of Remedial Education" and to offer some criticism of their method of evaluation and the concept of remedial education implied in their paper. In passing, it is perhaps worth mentioning that the methods of selection and treatment adopted at this Centre differ in many ways from those described in the article, particularly in the recognition of the need for the case study approach to selection and treatment. Furthermore, the conditions in the Department of Education at Birmingham, together with the facilities available at the Remedial Education Centre[1] are not equivalent to a fully equipped remedial service; provided by a local education authority. The primary purposes of research and training introduce important differences, which it would not be appropriate to discuss here.

The first consideration relates to Curr and Gourlay's use of the term 'true gain,' i.e., the difference between the gains made by the control group and the experimental group. In this experiment, the control group for Test Selected pupils had an initial mean Reading age of 7 years 0·8 months, compared with a mental age of 8 years 8·4 months—an average retardation of 1 year 7·6 months. In the six months of the experiment, this group made a mean gain of 8·5 months, which means that, as a whole, their rate of improvement in reading was at least as good as could be expected in the time. This means that during the experimental period—though these children were supposedly given no special help (being the control group)—their progress became normal. If they were capable of normal progress without special help, how had they come to be $1\frac{1}{2}$ years retarded at the beginning of the experiment? Curr and Gourlay might have offered some evaluation of this gain before using it to evaluate the gain made by the experimental group.

It seems at least probable that some factor (or factors) has brought about this recent acceleration in the control group's rate of progress.[2] L. B. Birch, on the basis of experience, has suggested that when testing is carried out and remedial groups are set up in a school, these measures influence the work of all the other teachers in subtle ways. That such stimulation does take place is a common experience of remedial teachers. There is also the obvious possibility that the class teacher, relieved of some of her more difficult problems for two sessions a week, had more time to deal adequately with those that remained. The fact that these children had been tested may also have drawn attention to

[1] A detailed description of the aims and organisation of the Remedial Education Centre of the University of Birmingham Institute of Education, is given in the *Educational Review*, Vol. 2, No. 1 (1949) and in the *National Froebel Foundation Bulletin*, No. 75 (1952).

[2] The thesis that pre-testing operates directly on the effectiveness of training or interacts with the teaching process and that merely taking a pre-test changes the subjects, attitudes towards teaching procedures, is (in a somewhat different context) discussed by R. L. Solomon in "An Extension of Control Group Design," *Psych. Bull.*, 46, 137-50, 1949. To quote from this article: "One fact stands out clearly. If we had used the ordinary two-group design (the experimental group and control group) the effectiveness of the teaching procedures would have been erroneously underrated. The pre-test has been shown to have vitiated some of the effectiveness of the teaching method. Thus, we have revealed a paradoxical case: With the currently used two-group design, the method used to evaluate the effectiveness of training procedures actually may operate to cut down the effects of training as they are capable of being measured by ordinary procedures. The implications here for educational research seem obvious."

their needs. As suggested by H. B. Valentine, the true gain is probably best measured by comparing the rate of progress a child has made during the school years *preceding* the remedial teaching with the rate of progress achieved *during* the period of remedial teaching.[1]

Remedial teachers will find it difficult to accept the composition of these groups as typical. One can sympathise with the investigators' difficulties in setting up an experiment of this type. It is obviously more convenient and administratively easier to take cases from a small number of schools and from a limited age group. In practice, this results in selecting children by a more lenient (and over-simplified) standard of retardation than would be adopted in setting up groups in an L.E.A. scheme or a Child Guidance Centre where limited time necessitates working with the more serious cases. In this experiment sixteen eight-year-old children intelligent, but retarded, had to be selected in each school in order to fill both control and experimental groups. Further limitations were no doubt dictated by the need for matching intelligence, sex and attainments. As a result, this study is concerned with the effects of coaching underfunctioning children rather than remedial education (in the full sense of the term) of children who are badly failing. Remedial groups of eight-year-old children with mean R.A.'s of about 7 years 2 months (and 7 years 10 months before the remedial teaching actually began) do not seem typical of children usually selected for remedial teaching. These children were certainly underfunctioning, but most of them not to the extent that would normally lead to their being selected for remedial help.[2]

Moreover, in practice, a remedial group is likely to be drawn from several age groups and will also include a number of older children whose continued retardation is symptomatic of some maladjustment or whose sense of failure and feeling of frustration makes them much more difficult to cope with. Curr

[1] See H. B. VALENTINE : " Remedial Education in a Child Guidance Clinic," *Brit. J. Educ. Psych.*, XXI, 1951. A similar method is described in " Non-directive Play Therapy with Retarded Readers," ROBERT E. BILLS, *Jour. of Consulting Psych.*, Vol. 14, No. 2 and No. 4, 1950. " The plan of the investigation included three periods of thirty school days each. The first of these periods was the control period, the second the therapy period, and the third was considered as a period for noting lasting or cumulative effects of the therapy. It was thought that the most adequate comparison which could be obtained would be made between the gain of each child during the therapy and third periods and his gain in the control period. Each of the therapy children could have been matched with other children on the basis of certain objective factors such as sex, age, grade, and intelligence, but it is far from certain that these are the important factors in the problem." The writer goes on to say, " It was assumed, therefore, that the children could be matched with themselves during two periods of the experiment with a greater degree of control of important personality variables than if they were matched with another group of children on the basis of objective criteria."

[2] BIRCH, in " Treatment of Reading Disability," *Educ. Rev.*, Feb., 1949, reports that his remedial groups had mean reading ages of 7 years 2 months, with retardation ranging from 3 years to 7 years. The mean age of the children was 10½ years.

H. B. VALENTINE, in " Remedial Education in a Child Guidance Clinic," *Brit. J. Educ. Psych.*, XXI, p. 51, selected for help children whose mean age was 10 years.

In school remedial groups in one Child Guidance Service (private communication) the average reading age was 7 years 4 months, while retarded groups receiving help at the Child Guidance Clinic had a mean reading age of 5 years 5 months. The range of retardation was from 3 years to 6 years and the mean age of all these groups was 11 years.

In Secondary Modern Remedial groups in Bolton in 1950-51, with children aged 11 years to 13 years, the average reading age was 7 years 4 months, the range of retardation being 3 years to 7 years.

At the Remedial Education Centre, Institute of Education, University of Birmingham, the mean age of the children receiving help in reading between October, 1950 to June, 1951, was 10 years 1 month. The mean reading age was 6 years 11 months, and the range of retardation was 2½ years to 7 years.

and Gourlay do not discuss qualitative differences of this type in the composition of their remedial groups. The remedial teacher who has frequently noticed a world of difference between two cases of the same reading age will feel the lack of any evaluation of this kind. One cannot, therefore, accept with conviction the hypothesis that this investigation evaluates the kind of remedial education that is carried out in remedial teaching schemes under L.E.A.'s or Child Guidance Centres.

There is also evidence of a limited use of the term, Remedial Education. There is no reference, for example, to attempts to discover the causes of backwardness and to deal, not only with educational weaknesses, but also their origin in emotional and social factors. Nor is there any attempt to assess improvement in attitudes and general adjustment. No doubt this aspect had to be excluded from the study for practical reasons, but it is perhaps worth noting that the exclusion of this aspect does constitute a not unimportant difference from the practice and emphasis of much Remedial Education. According to our view, Remedial Education means much more than sitting down in a classroom and coaching pupils in particular skills. It requires a total approach to the child. Not only must creative outlets be provided and, as far as possible, be integrated with the remedial work, but it is often necessary to widen the child's horizon and broaden his interests. Only if in this way he is helped to become more secure and confident in his relationships can it be expected that basic attitudes to learning will be modified and improved. Such improvement is not measured merely by an increase in attainment. Even substantial gains would not make us consider a case successful unless the underlying attitudes were satisfactorily modified. To illustrate, we should like to quote briefly from two recent cases seen and treated at the Remedial Education Centre :

Henry, referred for general backwardness at the age of 7½, had an I.Q. of 145 (in the group test given in school, incidentally, he scored an I.Q. of 92) made a gain of 3½ years in reading during seven months weekly attendance. Thus, coaching in reading had produced a very satisfactory result. The boy, however, was still timid, unable to mix, unhappy at school and not willing to make an effort in the face of difficulties. Remedial education in the full sense of the term had not yet been achieved. On the other hand, Arthur made little improvement in reading during his first year's attendance at the Centre. Referred at the age of 9, he was a complete non-reader though of average intelligence. Coaching in reading produced apparently little result, but remedial education had achieved a great improvement in the boy. When he first came to us he was an apathetic, monosyllabic and solitary child, at odds with his family (who had feared he might be mentally defective) and showing his craving for attention by immature, babyish behaviour. After the first year he had developed some self-confidence and normal boyish interests, had learned to stand up for himself, and perhaps most important, come to believe that he could learn to read. The parents' more hopeful attitude—achieved through the work of the Psychiatric Social Worker—no doubt contributed to his increased confidence.

The authors make a suggestion that " there is something in the theory that remedial instruction develops skills in answering one type of reading test, but the skill does not transfer to other types of reading performances." It is difficult to imagine what is meant by this, unless some very uniform drill-like approach to reading. Moreover, this suggestion is based on the results from an unstandardised reading test of which few details are given, e.g., whether the questions were experimentally graded in difficulty. A standardised test, different in type, could have been selected from the several available ones. Surely, the question deserves more exact treatment than this.

A small point, perhaps, but one that must be questioned is the choice of the Schonell Silent Reading Group Tests as the only assessment of reading improvement. They are more suitable for screening purposes in survey work, and one feels that these tests should have been supplemented by one or more other available tests. Nor can it be regarded as entirely satisfactory that the testing was done by students. Variations in the manner of test administration can make a considerable difference, particularly with young retarded pupils.

SUMMARY.

1.—The suggestion is made that the concept of true gain as used in the article, " An Evaluation of Remedial Education " has certain weaknesses in assessing the results of remedial teaching. An alternative method is advocated, namely, that suggested by H. B. Valentine, by which a pupil's progress during a period of remedial teaching is compared with his progress previous to that period.

2.—It is suggested that, as a whole, the children used in this experiment were not typical of the cases whose educational failure warrants their inclusion in remedial groups in L.E.A. or Child Guidance remedial teaching schemes.

3.—Since a child's needs for remedial education cannot be assessed merely in terms of the lag between attainment age and mental age, social and emotional factors are important not only in diagnosis and treatment, but also in the evaluation of remedial education.

4.—Some comments are made on the testing methods used in this experiment.

CRITICAL NOTICE

Personality Tests and Assessments : P. E. VERNON. (Methuen, 18s., pp. x+220.)

There are, Professor Vernon tells us, " three main situations in which personality tests or assessments are required—selection, experimentation, and diagnosis or guidance." Of these, " the field of selection," he believes " is least affected by the difficulties of personality theory and the many unsolved problems." Accordingly, his account of available methods is concerned, not so much with their relative efficiency as instruments of experimental research or as aids to diagnosis and guidance among children of school age, but rather with their practical value in dealing with the simpler and more straightforward problems of occupational selection among adults. Some of the most convincing and extensive studies that he cites are drawn from the work of himself and his colleagues on the " success of allocating recruits to jobs in the Services during the Second World War."

Hitherto practical workers in this country have had to rely almost entirely on American textbooks, like those of Symonds, Rapaport, or Bell, which naturally have in mind the assessment of American personality rather than of English, and, not unnaturally, seldom refer to investigations carried out in this country. As a result, the younger generation among teachers, school medical officers, and psychiatrists are apt to suppose that tests of personality are a recent importation from the United States. Professor Vernon's book is, therefore, doubly welcome ; it deals more specifically with the problems that confront the British student and seeks more particularly to cover the work of British contributors. Many readers will be astonished to discover how many of the various techniques which have recently been championed as American novelties are developments of devices invented by Galton, McDougall, and their followers nearly fifty years ago.

Professor Vernon reminds us that what was " not only the first projection test, but also one of the earliest methods for exploring such differences "—the test of free association—was " developed by Galton in 1879." He does not, however, note that the earliest systematic investigation of such tests was carried out by a London Head Mistress—in her day one of the most famous of British educationists—Dr. Sophie Bryant. She applied several ' tests of character ' not only to her own school pupils but also to eminent psychologists like Stout and J. M. Cattell.[1] It was McDougall who first aroused the active interest of psychologists and teachers in emotional and social characteristics ; and the earliest attempt to compare various types of test—free association, apperception of inkblots and pictures, unconscious motor reactions, the psychogalvanic reaction, and various laboratory tests of pulse, breathing, and the like—on the basis of empirical correlations, was prompted by his suggestions, and eventually reported in the forerunner of this journal (*Journ. of Exp. Pedagogy and Training College Record*, I, 1912, pp. 279f.).

The development of really efficient procedures, as Professor Vernon rightly and repeatedly insists, must be " largely dependent on a sound theory of personality " ; and accordingly, after briefly explaining what is to be understood by ' personality ' in modern psychology, he begins with a discussion of its nature. The old associationist doctrine, still favoured by many American writers—that " personality consists of vast numbers of independent *habits*, specific to each situation "—he unhesitatingly rejects. Both the idea and the phrase, " the structure of personality " we owe to McDougall ; and this conception Professor Vernon fully endorses. Personality, he says, " develops from the interaction of the human organism with an environment that conditions its impulses," and thereby " an organized system or structure is built up."

To determine in greater detail what are its main components and to arrive at " more accurate weighted trait-composite scores," the method of factor analysis is, he believes, of special value. No doubt its results are " not yet in a position to

[1] " Experiments in Testing the Character of School Children," *J. Anthrop. Inst.*, XV, 1886, pp. 338-349 ; cf., also *Mind*, XIV, 1889, pp. 230-250.

supply a complete and acceptable map." Still, in regard to the "major dimensions," there is, as he says, a reasonable amount of agreement. The earliest attempts to analyse children's emotional characteristics as assessed by teachers and other observers—carried out as long ago as 1915—led to the notion of three main components: " (i) a general factor of emotional stability or instability; (ii) a bipolar tendency towards introversion (inhibiting, repressive, or asthenic emotions) and its opposite; (iii) a number of still more specialized factors " (similar to what Vernon calls the ' instinctive drives ') " the whole forming a working ' hierarchical scheme '."[1] Professor Vernon accepts a very similar scheme, and prints an instructive diagram, comprising over 20 traits, to illustrate the main lines of his conception. The first factor—" the most pervasive and far-reaching dimension "—he prefers to name ' dependability ' rather than ' stability.' The next most important factor, he says, corresponds broadly with the " extravert-introvert dichotomy," though he reminds us that " this conception has been variously interpreted." His diagram will be found most helpful to those who wish to devise a practicable and comprehensive scheme for recording the fundamental characteristics of the personalities they are studying; and the " rating scale for recording qualitative observations during testing and interviewing," appended to a later chapter, will be still more useful to the practical worker.

In discussing the reliability and validity of the chief methods available, Professor Vernon begins with the interview. " As a diagnostic technique," he says, " it is on the average extremely unreliable and invalid." Nor can he find evidence that " psychiatric interviewers, or psychologists who make use of the concepts of abnormal psychology, are any more consistent, or capable of making more valid educational or vocational predictions, than those trained in normal and applied psychology; however valuable the medical approach may be in therapy, the bulk of research shows that it has little to contribute to selection or guidance."

He turns next to the ' physical signs of personality.' " Kretschmer's theories," he believes, " cannot be accepted without qualification "; and, though " Sheldon's somatotypes may be significant, Sheldon's original correlations are obviously spurious." Here again factorial studies are valuable in checking what small amount of truth there may be in these revivals of traditional speculations about the physical and mental characteristics of ' temperamental types '—a conception still popular with many teachers and psychiatrists.. And almost every psychologist will accept his final verdict that, " although such relations undoubtedly exist, any system of diagnosis based on such signs is bound to be false."

Observation directed to expressive movements rather than static appearance provides a more promising source of clues. But, except Professor Vernon himself, few psychologists in this country have made any attempt to work out practicable techniques along these lines. The use of tests involving " real life situations " has furnished " quite promising results." He describes the encouraging success obtained with such devices in early work with delinquent and subnormal children, and regards these investigations as " forerunners of the later developments " when War Office Selection Boards introduced somewhat similar techniques. The " follow-up studies have given low correlations with the officers' subsequent success "; but " one can at least state that the method is superior to older methods based on

[1] For a summary of later factorial researches on this problem among school children, and their bearing on the work of the teacher, the reader may be referred to the ' Symposium on Personality,' in this *Journal*, and more particularly to the paper on ' The Assessment of Personality ' (Vol. XV, pp. 109f.).

Further research indicated the need for adding another bipolar factor—euthymic *versus* dysthymic, representing the tendency towards cheerful or pleasant emotions and the reverse, and corresponding with the ancient antitheses between the ' sanguine ' and the ' melancholy ' types, the optimist and the pessimist, *l'allegro* and *il penseroso*. Professor Vernon mentions this in passing: he also includes the ' melancholic ' (or ' dysthymic ') in his diagram, but, strange to say, not their opposites. Since recent investigations of personality have been so largely pre-occupied with the study of neurotic and psychotic patients, it is possible that the existence of cheerful or optimistic types has tended to escape the statistical microscope of later investigators.

interview alone." However, he considers that the recent vogue of group observational procedures is due more to their "high face validity" than to their "proven value."

With the various impressionistic techniques for "rating and judging personality," including self-ratings and questionnaires, he deals far more fully. His conclusion is that, "despite their extreme weaknesses and dangers, paper and pencil tests and questionnaires should not be entirely condemned"; but he fails to see any use whatever in selection for miscellaneous personality inventories like the Bernreuter, Bell, Guilford, Boyd, etc." What it is now the fashion to call 'projection tests'—old devices with a new name—form the subject of his longest chapter. Few of these, he finds, are really satisfactory. "The interpretation is a lengthy and elaborate business, depending too much on subjective judgment; and the evidence for their validity is poor." Indeed, "it is a moot point whether a psychological tester's assessments of such traits as stability, impulsiveness, persistence, etc., based on observation of behaviour at apparatus tests would not be more reliable and valid." He is equally critical of so-called 'objective' tests. Many of them, as he justly observes, involve processes that are far too simple and specific to elicit qualities of character important for daily life; on the other hand, those which come closer to everyday conduct are too readily influenced by the way the test is put across and by the examinee's attitude to the test situation. And, in point of fact, recent studies like the earlier have shown that the devotee of laboratory techniques is too apt to overestimate both the reliability and the validity of such procedures as a means of predicting actual behaviour. On the whole, it will be seen, Professor Vernon's estimates of the relative merits of the different methods available for assessing personality seem to accord fairly well with the conclusions reached at the close of the Symposium in this *Journal*; and, of course, they are based on far wider and more recent data.

One difficulty, as Professor Vernon remarks, nearly always hampers psychological researches with adults: trustworthy criteria for checking the test-results are difficult to obtain, and adequate opportunities for following up the persons tested and securing detailed after-histories are usually out of the question. These and other limitations may in part account for the lower coefficients generally reported in work with adults. However, even when due allowance has been made for such drawbacks, we must, I think, accept Professor Vernon's somewhat pessimistic verdict. With children a more hopeful view may perhaps be taken: for them better criteria can be procured, and after-histories more easily followed up. Yet here too, it must be admitted, the discovery of really efficient procedures must largely depend on the development of "a more adequate theory of personality."

All who are concerned with the study of individual personality—teachers as well as educational psychologists—will find every page of his book well worth the closest examination and reflection. The discussion is both lucid and terse, the survey comprehensive and impartial; and few books on psychology have succeeded in packing so much information into so little space.

CYRIL BURT.

SUMMARIES OF RESEARCHES REPORTED IN DEGREE THESES [1]

The Construction and Administration of a Reading Comprehension Test Using Mathematical Material.

By R. C. S. HAMILTON

(Summary of a thesis submitted in part-fulfilment of the requirements for the Ed.B. Degree, Glasgow University, 1952.)

The aims of this investigation were :

(1) To provide an instrument for the measurement of reading comprehension of mathematical material as it appears in text-books and in problem solving.

(2) To apply this instrument and to investigate the relevant problems of prognosis and diagnosis in respect of mathematical achievement.

The test of reading comprehension was constructed as follows : A series of introductory passages dealing with a new topic in arithmetic was chosen from general arithmetic books. These did not provide worked examples or routine drill. Thus the pupil was faced with the task of assimilating the ideas presented into his own background of experience as in problem solving.

A set of " True-False " statements was prepared for each passage to be marked as true or false by the pupils. After a sample investigation on twenty-four subjects who took no part in the later investigation, item analysis was carried out and the test was reduced to ten passages with ten accompanying statements for each, making a hundred items in all. The test was prepared in two Forms. An optimum time of fifteen minutes was chosen for each Form.

The first passage and its ten accompanying statements were as follows :

" If a dealer buys an article for £100 and sells it for £101, his profit is a small one. But, if he buys an article for £2 and sells it for £3, his profit is relatively large although he gains £1 in both cases. The only fair way to compare the two deals is, therefore, to find what fraction the profit is of the cost price.

(1) If you always make £1 profit, it is a good deal.
(2) You can make a relatively large profit without selling dear articles.
(3) The profit divided by the cost price gives a good estimate of the profit.
(4) If the profit is a large fraction of the cost price, it is a good deal.
(5) It doesn't matter how you compare the profits.
(6) The profit must always be less than the selling price.
(7) It is better business to sell a 1s. book for 1s. 6d. than a 6d. one for 10d.
(8) The profit divided by the cost price must always be a fraction which is less than one.
(9) You need to know the cost price as well as the profit before you can say whether it is a good deal.
(10) We always find what fraction the profit is of the selling price."

The test was administered to a complete year group consisting of 127 boys and 129 girls in the first year of a senior secondary school course. The test was given to groups of 30-35 pupils. Each pupil took Forms 1 and 2.

The frequency distribution of the scores of the 256 subjects was tested for normality. Chi-squared was 5·16 for 3 degrees of freedom, giving $P=0{\cdot}16$. There was no significant deviation from normality and the distribution was, therefore, accepted as normal.

The reliability of the test was found by the Split-half method to be $0{\cdot}86 \pm 0{\cdot}01$. Application of the Spearman-Brown formula gave a coefficient of 0·92 for the whole test.

The equivalence of the two Forms was checked. The means were 24·85 and 24·52 while the S.D's. were 8·90 and 7·76. The mean scores for the whole test for

[1] These Outlines must be submitted through the Head of the Department in which the research was carried out.

boys and girls were $53{\cdot}82 \pm 0{\cdot}77$ and $45{\cdot}37 \pm 0{\cdot}82$, respectively, while the S.D's. were 13·0 and 13·9. This gave a statistically significant difference in favour of the boys.

The mean age of the subjects was twelve years, eight months, with an S.D. of $5\frac{1}{2}$ months. The group was tested for I.Q. on the group test administered to pupils in Glasgow Corporation Schools. Thirteen subjects were absent during this testing and had to be rejected from further investigations. The mean I.Q. for the remaining 243 subjects was $108{\cdot}66 \pm 0{\cdot}37$, with an S.D. of 8·50.

The scores made by the 243 subjects in the school term examinations in English, Mathematics and Arithmetic, were noted and inter-correlations calculated by the product-moment formula. These are shown in Table I.

TABLE I

	Test	English	Mathematics	Arithmetic
I.Q.	·41	·23	·44	·23
Test	—	·17	·33	·22
English	—	—	·28	·20
Mathematics	—	—	—	·71

These correlations were all found to be statistically significant. The partial correlation between the Test and Mathematics, holding I.Q. constant, was 0·18, and was significant. The correlations I.Q. /Test and I.Q. /Mathematics were the highest (except, of course, Mathematics /Arithmetic) and it was decided to investigate these further as follows :

A sorting process was carried out on the I.Q. Test, and Mathematics scores as shown in Table II. The mean was taken throughout as the criterion of division into High and Low. The differences between the various group means were tested for significance and are summarised in Table III.

TABLE II

Group 1	Group 4	Group 5	Group 8
High I.Q. High Test Maths. Mean 67·0	High I.Q. Low Test Maths. Mean 60·7	High I.Q. High Maths. Test Mean 57·1	High I.Q. Low Maths. Test Mean 47·7
Group 2	Group 3	Group 6	Group 7
Low I.Q. High Test Maths. Mean 58·0	Low I.Q. Low Test Maths. Mean 52·3	Low I.Q. High Maths. Test Mean 47·8	Low I.Q. Low Maths. Test Mean 42·6

The last column in Table III shows the probabilities of these differences being due to chance. Examination of these probabilities at the 1 per cent. level of confidence yields the following results :

Group 5 are significantly superior to group 8 on the Test, indicating that high I.Q. alone is not a sufficient condition for success on the Test. This suggests that the Test does indeed test mathematical comprehension.

In the group pairs 1—2 and 3—4, those with high I.Qs., are significantly better at mathematics than those with low I.Qs. This seems to indicate that the I.Q. is a major factor in success in school mathematics.

TABLE III

Groups	Difference of Maths. Means	S.E.	't'	Probability
1 and 2	9·0	2·38	3·78	>0·001
2 and 3	5·7	2·33	2·45	0·015
3 and 4	8·4	2·97	2·83	<0·010
4 and 1	6·3	3·00	2·10	0·035
	Difference of Test Means			
5 and 6	9·3	2·30	4·05	>0·001
6 and 7	5·2	2·47	2·10	0·035
7 and 8	5·1	2·74	1·86	0·065
8 and 5	9·4	2·58	3·64	>0·001

Group 5 were significantly superior to group 6 on the Test, which may account for the fact that some pupils who apparently do well in first year mathematics do less well later. They may have substituted manipulative skill for real understanding, a practice which may go undetected in the first year.

From this investigation the following conclusions may be drawn :

(1) The boys score significantly higher than the girls in the reading comprehension of this mathematical material.

(2) In view of the low correlation between test and English there seems to be no reason to believe that increased general reading will improve the reading of mathematical texts.

(3) The I.Q. (taken in conjunction with other relevant factors) seems to be a reasonably good indication of possible success in mathematics.

(4) There appears to be a relatively low I.Q. group who do not fully understand the principles involved, but give the appearance of being successful in first-year school mathematics. They can assimilate the techniques, but they do not appreciate when to apply them. This may account for wastage in secondary school mathematics courses and may merit special attention.

Scientific Curiosity in Relation to Science Attainment in School.[1]

By J. H. CHAPLIN

(*Summary of a thesis presented in part-fulfilment of the requirements for the Ed.B. Degree, Glasgow University*, 1952.)

This investigation arose out of the interest displayed by pupils in the functioning of modern mechanical devices, which was discovered as a result of the introduction of a period of open discussion after the normal science lesson. It was decided to make a test of Scientific Curiosity which might be predictive of scientific success in school. The test was devised to discover those children who had taken the trouble to explore fairly common objects of scientific interest.

The items of the test consisted of actual objects or parts of objects which the child was allowed to handle. These were selected from articles in everyday use : e.g., bicycles, radio sets, electrical appliances, household tools, etc. Where possible, the outer coverings were removed, in order that they should have an unusual aspect.

[1] Part of a Symposium on Scientific Curiosity and Interest in Relation to Science Attainment in School, read to the Scottish Branch of the British Psychological Society on 29th November, 1952.

First selection and grading of the items was carried out by one hundred pupils not taking part in the test proper. A summated rating technique eliminated items lacking in discrimination. A twenty item pilot test was then given to forty subjects. The small numbers allowed the construction of a Student-Item chart and an Analysis of Variance between items and between students proved the test to be discriminating between pupils. Calculation of the ratio of percentage difference to standard error of the differences was used to eliminate items. On the basis of this item validation a new test was designed having twenty-five items, and it was given to one hundred and five boys in the age range 12 years 6 months to 13 years 10 months, whose distribution of I.Qs. is shown in Table I.

TABLE I

I.Q.	<90	-95	-100	-105	-110	-115	>116
f	7	40	27	18	7	4	2

The items were laid out on long benches and a number was assigned to each item. The subjects entered at one minute intervals and a prepared sheet was handed to each as he entered. The scoring allowed two marks for naming each object and two for stating where it is used or for what purpose. Science attainment scores were obtained by averaging the marks gained by pupils in the last two term examinations.

An assembly test was also devised. This consisted of setting up a piece of scientific apparatus which is used for calculating the coefficient of expansion of metals. Although the apparatus depends for its functioning on the principle of levers, a knowledge of this was unnecessary. Much interesting information was gained from this test since it was completely novel to the pupils, but marking difficulties made scoring impossible, or too subjective to be of any value.

It is to be expected that the child who has a high score on a test which purports to measure scientific curiosity will also be high on a Scientific Interest rating. To test this hypothesis, and as a further validation of the Curiosity Test, a Scientific Interest Rating Scale was devised and administered.

As an external criterion a teacher's rating was also obtained, and, since it was realised that the term " Scientific Curiosity " implies a specific form of the more fundamental general curiosity, it was decided to seek a Curiosity rating from the teacher, without any mention of the term " Scientific."

Finally, the Intelligence Quotient of each of the subjects was obtained, using the Moray House Calibration Test.

Correlations between Scientific Curiosity and the other variables are given in Table II.

TABLE II

	r
Scientific Curiosity—Scientific Attainment	·654
Scientific Curiosity—Scientific Interest	·480
Scientific Curiosity—Teacher's Rating	·604
Scientific Curiosity—Intelligence Quotient	·124
Intelligence Quotient—Scientific Attainment..	·371

The main test can be said to measure the degree of scientific curiosity present in pupils. Its positive correlation with science attainment gives it predictive value for science higher than that given by the I.Q. Interest and curiosity are related and, in fact, interest may be regarded to some extent as sustained curiosity. The assembly test did not give scope for that spontaneity which is an essential component of curiosity.

The Construction of a Word Projection Test and its Application to Grammar School Pupils.

By J. A. H. OGDON

(*Abstract of thesis submitted in* 1952 *for the degree of M.Ed. in the Department of Education, University of Manchester*)

This research is based on the word association test.

A tachistoscopic machine loaded with cards was used. Each card presents a portion of a word ; the amount presented allows subjects to make immediate variant interpretations. L – – – AGE gives choice of three responses : LANGUAGE, LUGGAGE, LINEAGE. The element missing from the word (an arbitrary excision varying in extent) may be initial, medial, or final : – – – TURE (PICTURE), MA–E (MATE), POLI – – – (POLITICS). The item-stimulus is called a skialog.

Three hundred such skialog-items, derived from Thorndike's Junior Frequency Dictionary, were composed into a written group-test. After test instructions a short trial run was given to establish the pattern of reaction. Sheets of close-ruled foolscap, previously divided into columns, were issued to the subjects. Whole forms were tested : between 25 and 30 boys at each grammar school form-level from the firsts to the sixths.

60 scripts, supplied by form 3C and form 4A, were then taken up for analysis. 4A is a typical A form ; 3C is of poor scholastic quality. After three and four consecutive years' teaching all the boys were well known to the experimenter.

The test having proved mechanically sound, the first survey of the results of this pilot research was exploratory. 17,700 responses were obtained. The 300 skialog-items produced 3,412 variants (distinct and different words). They are a fair sample of an average vocabulary, mostly short words in common use.

Analysis then went in two directions : the effect of items on boys, as revealed in frequencies ; and the effect of boys on items, as given in variants. The Standard Response was revealed first : all variants of 8-plus frequency were considered as standard. 682 of the 3,142 variants (about 22 per cent.) were found to be standard ; 192 of the average boys' 295 responses were standard. The test frequencies of all variants were directly compared with their dictionary frequencies (Thorndike-Ballard).

Special interests were not consistently reflected in the boys' choices of variants, but it had been proved in one of the try-outs—on an intimately known group—that certain aspects of personality were revealed in constellations of responses ; for example : crude emotionality, vocabulary tinged with pomposity, musical and literary interests. A detailed survey of results was now possible in one of three directions : a scrutiny of subjects' scores on Standard variants as reflecting the general factor of conformity (C) ; or an examination of the vocabulary range and quality of individual subjects (V) ; or a scrutiny of subjects' scores made on a list of affectively coloured variants (A). The study and analysis of affectivity scores was chosen. A criterion was first prepared, the experimenter's personality rating of the boys, based on behaviour and attitude in form, responsiveness and liveliness under instruction.

From the total of 3,412 variants, 893 were subjectively chosen as having affective colour, such words as TRANCE, FEAR, SNAKE, SIN, ANGEL, HAG. The scores (ranging from 75 to 32) which subjects made on this ' affectivity ' list of variants, supplied the first rank order (N.60.). This order was divided into equal thirds : Group I, more affective, with higher scores ; Group II, neutral, with moderate scores ; Group III, less affective, with lower scores. An item-analysis was then made of the 682 *standard* variants. Those variants which were favoured by the more affective Group I were classed as positive, while those favoured by the less affective Group III were classed as negative. Both positive and negative variants were then graded in rank order, according to the amount of preference they received from Groups I and III, preference being reckoned in percentage of frequencies.

66 positive and 66 negative variants, each offering 812 frequencies, were ranked in this way.

According to scores made on these variants (66 positive, 66 negative) two fresh rank orders of subjects (N.60) were now prepared, one positive, one negative. Each boy's new positive score was then divided by his new negative score, and this ' ratio of affectivity ' supplied a fourth rank order. This was divided into four broad groups, which were correlated with the four-point personality rating (criterion), producing an r-phi of ·7217. Up to the present this is the only indication of the *extrinsic* validity of the test.

At this stage four rank orders (N.60) had been obtained. They were (i) the original and independent ' affectivity ' order based on the 893 *affective* variants of low or single frequency ; (ii) and (iii) the positive and negative orders derived from the item-analysis of the 682 *standard* (high-frequency) variants ; (iv) a ' ratio of affectivity ' order obtained by dividing (ii) by (iii). There were also Form Orders (F) and Form English Orders (E) available for the series of rank-order correlations.

In brief, the original *affective* order gave the following correlations with orders based on the highest frequency *standard* variants : +0·83 with positive order ; −0·88 with negative order ; +0·896 with the order based on the ratio of affectivity. Very low positive correlation (0·06 Form 4A, 0·02 Form 3C) was observed between the affectivity orders and the Form orders, which, in the grammar school, represent attainment and general intelligence. Between the affectivity orders and the English orders a somewhat higher coefficient was obtained (4A, +0·34 ; 3C, +0·18) reflecting, it is believed, the relative verbal proficiency required by a verbal test.

The affectivity scores measure the amount of emotion expressed in words, under test conditions ; but no separate account is taken of that control of conation which might be exercised by any subject. Such control, which is basic to studies of the will, is yet another variable and is deeply implicated with affect. Considered in its context of conation, the affect measured by this test may be related to Webb's " w," Burt's " e," or Eysenck's " p " ; the scores may be part of a continuum pointing upwards to the hysteric, downwards to the dysthymic. The last boy in the whole group (N.60), last in affective score, positive score, and affective ratio, is particularly apathetic and flaccid. Scrutiny of the 4A (N.30) order based on affective ratio, indicates that the first and twenty-ninth places are occupied by the only two boys who have had psychiatric attention : while the thirtieth place is held by a pale emaciated boy who has had frequent long absences on account of ill-health.

This pilot experiment offers scope for more detailed research on affectivity ; on the probable connexion between standard responses and the general factor of conformity ; and on the nature and range of vocabulary at different age-levels, and particularly on the differences in verbal facility manifested by boys and girls.

BOOK REVIEWS

Social Psychology and Individual Values: D. W. HARDING. (Hutchinson, 8s. 6d., pp. 184.)

The theme of this book, says Professor Harding, is " the development of the social individual, the being who could realize virtually none of his possibilities without the elicitations offered by a social group, but whose growth remains individual, sometimes falling short of what his society expects, sometimes going beyond it, sometimes taking directions that no member of the group has previously explored." The individual is the central figure, and Professor Harding asks how far societies and their sub-groups cater for his needs and pave the way for his development, and thus make the best use of their human resources.

After discussing the view that sociability is derived from the fact that infantile needs are satisfied by other people, Professor Harding rejects it in preference for the residual category of innate disposition. A disposition for what? Not just a need for the mere rubbing of shoulders, for a man may be more lonely in a crowd than on a lonely moor, but rather for " friendly contact with congenial people (*a*) sense of having a function in one's group, and (the) knowledge of social sanction for one's scale of values."

But, Professor Harding points out—and this is perhaps the main value of his book—man is not merely a social animal; he has desires, interests and values which may bring him into conflict with other members of his group, thereby causing a state of tension in himself when he is torn between conformity with group standards and the pursuit of his own ends. Here Professor Harding makes use of the distinction made by Trotter between those who are mainly ' resistant ' to their own individual promptings, and those who are what he called ' sensitive,' and take their own experience seriously. It is these latter who, if endowed with sufficient vigour may become the ' innovators ' in art, morals, philosophy and other walks of life, and by their influence bring about changes in the social climate.

The ' innovators,' however, need a society plastic enough to admit the possibility of change, and they also need social support while they are exploring the new regions of thought and activity that have been opened up to them. This need for support is to a certain extent met by the existence of sub-groups, which encourage the development of special interests and aspirations by providing the requisite social sanction and stimulus. From another point of view, the existence of sub-groups of this kind leads to the general enrichment of the society as a whole. Indeed, the social function of such sub-groups is to ensure that the best use is made of the special talents and interests of the individuals who constitute the society.

This emphasis on individual excellences leads Professor Harding to consider a problem of special interest to the student of education. How, he asks, are we to be sure that those who are above the average, intellectually, or in moral or aesthetic sensibility, will have the chance to grow to their full stature? We concentrate on those who are below par; ought we not to pay more attention to the prospects of genius? or are we too envious? How can teachers be trained to deal adequately with pupils who are potentially brighter than they are themselves?

The chief merit of the book as has been said, lies in the stress laid on the contribution of the individual to society, and on the duty of society to see that his talents are not wasted. In pursuit of this theme Professor Harding discusses with subtle discrimination such topics as pugnacity, competition, social status and leadership. His aim is not to churn out all over again the well-known evidence, such as it is, but rather to raise questions which will interest the layman. In this he succeeds admirably. He has, in fact, written a book which could well be used as the basis of a course of instruction and discussion in Adult Education, and—if the wretched pressure of examinations would allow—in the senior classes in schools.

W.J.H.S.

Psychiatry To-day: D. STAFFORD-CLARK. (Penguin Books, pp. 304, 2s. 6d.)

Dr. Stafford Clark has attempted to give a popular account of the history, methods and social implications of modern psychiatry. He begins with a couple of historical chapters describing how psychiatry has, at length, " emerged from the mists of witchcraft " ; and then proceeds to a detailed account of the causes, treatment, and prevention of mental disorders ; he concludes with four chapters on the wider contributions that he believes the psychiatrist can make, not only to general medicine, but also to numerous problems of modern civilized life. For the non-medical reader who seeks to understand the rapidly changing views in the " youngest branch of medicine ," his survey is admirable. He betrays no strong prejudices for or against any particular school ; and his account is doubly valuable because it is at once critical and eclectic.

At the same time, there is a danger that teachers and educationists who take up his book may suppose that his pronouncements on general psychology are as trustworthy as his survey of medical problems..

In his discussion of " the realm of art " Dr. Stafford-Clark quotes the usual lists of poets, novelists, and dramatists, who are alleged to have been ' mentally unbalanced ' ; and apparently accepts the notion, cherished by so many medical men, that the psychology of genius is essentially a branch of psychopathology. Actually, as the investigations of Terman and his colleagues seem conclusively to show, the incidence of mental disorders is, if anything, lower among the exceptionally gifted than among the general population. Such investigations, however, Dr. Stafford Clark silently ignores. But he does point out one " monumental and inescapable fallacy," which, he believes, awaits nearly all psychoanalytic interpretations ; almost inevitably, he says, the psychiatrist is tempted to fill up the gaps left by the artist's imagination with the products of his own imagination, often derived almost exclusively from the study of the abnormal.

In his account of the methods and the conclusions of those whom he calls " normal psychologists " he makes numerous errors. He tells us, for example, that intelligence " was first studied and measured by Binet in the twentieth century " ; and to " Binet and his colleagues " he ascribes tests, statistical procedures and technical conceptions (e.g., the intelligence quotient) that were not introduced until much later. He emphasizes the importance of non-cognitive tendencies, particularly ' human instincts ' (such as the ' instinct for self-preservation '), but he regards them as ' patterns of behaviour relatively perfect at their first performance ' ; ' conation ' he supposes to be the psychologist's name for the ' faculty of exerting decision.' In discussing dullness and backwardness among children he declares that anxiety, frustration, and unhappiness are far more frequent causes than innate lack of the requisite intelligence. After this it is not surprising to find that the various conclusions reached by psychologists in the field of child guidance after many years of research are described as " important discoveries of this branch of psychiatry."

Psychologists by now are prepared to expect errors and confusions of this sort when medical experts write on topics which, in Dr. Stafford-Clark's phrase, lie " outside medicine " ; but it is a little distressing to find them put forward in a book by one who is the Lecturer on Psychopathology at a well-known university. However, this should not lessen our appreciation of what he writes about his particular field. Every reader will be grateful both to him and to the editors of the Penguin Series for giving us what is unquestionably a useful and inexpensive survey of a relatively new branch of medicine which has recently attained such practical importance and aroused such widespread popular interest.

C.B.

Out of Step: JOSEPH TRENAMAN. (Methuen and Co., 1952, pp. XX+223, 21s.)

This is probably one of the most important studies of delinquency published since the war. It was carried out in one of the ' Special Training Units ' set up by the Army in the early war years to try to deal with persistent offenders against military discipline. It is unusual among such studies first in that it deals with young adults well past school age and second in that the delinquents co-operated so fully with the

investigator who spent many months in closest personal contact with them as their tutor, advisor and friend.

The book is divided into five parts. The first part of these, entitled ' Special Training,' deals with the setting up of the Special Training Units with their carefully selected staff, some of whom had had experience in Borstal Institutions or as probation officers. In many ways these units resembled the ' Open ' Borstals of civilian life. They gave a modified form of normal military training and through it the staff concentrated upon achieving the best possible personal relationships with the men who were treated as individuals with serious personal problems which needed sympathetic investigation. The delinquents were made to realise that the staff were there primarily to help and not to punish. Claims for the results achieved by the special training are very modestly stated with a clear awareness of the many factors which might have contributed to a changed attitude in these men. It would seem, however, that quite remarkable success was achieved.

Part II, ' The Offender,' deals chiefly with the personal characteristics of the young men in the group studied. Apparently in most respects, e.g., physique, health and educational attainments (or rather lack of them) these Army offenders were little different from the usual run of delinquents in civilian life and, in fact, one-third of them had, before enlistment, been brought before the courts. Unlike most previous workers, however, Mr. Trenaman finds that the distribution of intelligence in the delinquent group was closely similar to that of normal men of similar age and background. It is suggested that the most likely explanation of the difference between these findings and those of Burt, for example, lies in the choice of test. Here Raven's Matrices were used whereas previous workers have used verbal tests whose scores would be depressed by low educational standards.

The third part called ' The Offender in Conflict with the Army ' describes the attitude of the men towards the Army and shows how many of these delinquents who were dissatisfied with the Army were equally dissatisfied with civilian life ; nearly two-thirds of them had volunteered for the Army to escape from distasteful situations to which they could not adjust themselves. There are descriptions of the particular offences of these young soldiers and the ineffectiveness of punishment as a deterrent to persistent offenders against Army discipline is clearly shown. In Part IV an account is given of investigations into each delinquent's environment ; his work, his leisure activities, his family and his school days. The final section of the book gives a careful analysis of the factors which were found to be associated with delinquency. The method used was that made familiar by Burt in his *Young Delinquent* in which the incidence of separate factors in the sample of offenders is compared with their incidence in a normal control group. In all, twenty-four factors were investigated and assessed as major or contributory factors. The findings here tend largely to confirm those of earlier workers.

The whole book is clearly written, well documented with references to work in this country and cautious in its inferences. It will prove very valuable to all who have dealings with young people and specially to those concerned with the rehabilitation of young offenders. L.B.B.

Contributions of Psychology to Social Problems (L. T. Hobhouse Memorial Trust Lecture, 1952) : Sir Cyril Burt. (Oxford University Press, pp. 76, 5s.)

L. T. Hobhouse, to whom, more than to anyone else, the establishment of sociology in this country is due, is sometimes thought of as a mere speculative thinker, a liberal philosopher sounding a note of hope, a man of large ideas—anything, in fact, but a scientist. And yet, as Sir Cyril Burt points out in his Hobhouse Memorial Lecture: " Hobhouse constantly stressed the need for adopting objective and scientific methods in the different fields of social and political inquiry." He particularly called for objective research into " the distinctive elements in our common human nature that determine social relations " and into the question : " How do social relations react upon the individual mind ? "

In his lecture, Sir Cyril summarises the work done in this country—work to which he himself and his students have made important contributions—in connec-

tion with these two topics. He discusses the views put forward by English thinkers on the social nature of man, which account for the similarities in social behaviour, and then passes on to an account of the evidence for variations in innate intellectual equipment. The next and larger part of the lecture is concerned with social conditions and their effect on the individual. Sir Cyril deals with the problem of experimental and statistical techniques and with the importance of skilled observations. After these preliminaries he turns to the topic of social class : the appropriate criteria for differentiating between one class and another, the evidence for differences in ' ethos ' between classes, and the relation between class membership and individual characteristics. This is, perhaps, the most interesting part of the lecture. In it Sir Cyril reports on his application of factorial analysis to detect broad lines of difference, and discusses the emergence of a general bi-polar factor of conformity-heterodoxy, and two further bi-polar factors of realism-sentimentality and intellectual *v.* practical interests. "Each of these factors," says Sir Cyril, "shows a significant correlation with social class." The concluding sections on "Leisure Activities," gambling, religion, morality and reading habits are somewhat gloomy, but Sir Cyril ends on a more cheerful note—Sin, after all, is news—Virtue is not reported.

The reader cannot help being struck, once again, by Sir Cyril's learning, by his capacity to marshall a large number of facts for orderly presentation, and by his distinguished style of writing. It would, indeed, be difficult to find a memorial lecture more packed with information and more enjoyable to read.

W.J.H.S.

Intelligence Tests for Children : C. W. VALENTINE . (Methuen, 7s. 6d.)
Apparatus for Intelligence Tests for Children : C. W. VALENTINE. (Methuen, 7s. 6d.)

This is the fifth edition of what is, perhaps, one of the most useful individual intelligence tests for children. The extension of the tests to cover all ages up to 15 years has preserved that balance of verbal and non-verbal items which makes the test eminently suitable for children of very widely differing levels of verbal ability. For this reason, the test is not only valuable for use with the brighter 11-year-olds but it is invaluable in the testing of the duller children of low verbal ability between whom the more purely verbal test fails to differentiate. I have found this to be true in the course of testing some 300 children in my own school over a period of eight years ; and in addition the I.Qs. obtained have given a remarkably good prophecy of educational attainments several years later.

The apparatus needed for the administration of the test has now been published in a handy form, in plainly marked envelopes. Users of the test can now be satisfied that their material is standard. Moreover, the use of the separate apparatus will avoid the distractions of the nearby print that is sometimes found when the diagrams in the book are used. I should have liked to see the picture for age 3 : 6 in colour since at the early ages co-operation is much more easily obtained when brightly coloured material is used.

B.B.W.

The Importance of Illiteracy : M. M. LEWIS. (Harrap, pp. 187, 7s. 6d.)

The first half of the book examines popular conceptions as to the nature, extent and causes of illiteracy. The evidence for and against these is presented impartially and the conclusions drawn are clearly and cautiously stated. There is little here which will be new to most educational psychologists, but they and teachers will find the reading well worth while for the emphasis is strongly on the social aspects of the problem, whereas most recent books have stressed the personal nature of reading disability. A particular interesting chapter is one on resistance to literacy, a subject which usually receives little notice. Here it is seen as a result of tensions between a person and some part of his social environment and the possible causes of tensions which may set up resistance are discussed at length.

The book is not, however, so much concerned with illiteracy in its narrower sense as with the wider problems of communication whose new techniques of popular press, radio, television and cinema have created a need for higher standards and new kinds of personal literacy. Dr. Lewis shows that the present national anxiety over illiteracy is connected with the fact that rising standards in society as a whole make demands for higher and higher standards in the individual, standards which fewer people find it easy to achieve.

The last chapter entitled " What must we do ? " is disappointing, for after so able a statement of the problem one hoped for an equally clear solution. It is true that the book makes no attempt to deal with the day-to-day methods of teaching sub-literates, the reader being referred to the standard text-books for these, but in urging the study of linguistics to provide the insight necessary to solve the problem of illiteracy, the author seems very remote from the ten to twenty per cent. of children in our schools who are in immediate need of help because they are failing to achieve a satisfactory standard of literacy.

The book is well documented, especially with English references, and there are some useful notes which will be of value to teachers who wish to read further.

L.B.B.

Current Trends in British Psychology : Edited by C. A. MACE and PHILIP VERNON. (Methuen, pp. 262, 15s.)

This book consists of the papers given in the Psychology Section of the Edinburgh Meeting of the British Association in 1951. There was general agreement at that meeting that prominence should be given in all sections to the British contribution to the progress of science ; the psychology section decided to give no historical surveys but only papers presenting the position of British psychology to-day and its current trends. As there are twenty papers it is obviously impossible to give a satisfactory review of the book in a brief form. The names of the editors are a guarantee that at least a certain level shall be displayed in the various papers, although, of course, individual views are often emphasized. The papers are supposed to be suitable not only for specialists, but for the general reader ; this, however, while it applies to a great number of the papers, certainly does not apply to others which would be much more suitable for the university student of psychology in his second or even his third year, and would be difficult for a general reader to understand.

The book is divided into two parts, the first dealing with Fields of Applied Psychology, and the second with Concepts and Methodology. The papers of greatest interest to most readers of this *Journal* would be the following, which are given in the order in which they appear in the book : " Vocational Guidance in Britain " : A. Rodger, B.A. " Educational Selection and Allocation " : D. McMahon, M.A. " The Psychology of Basic Educational Techniques " : W. D. Wall, B.A., Ph.D. " Statistical Analysis in Educational Psychology " : C. Banks, B.A., Ph.D., and C. Burt, M.A., D.Sc., LL.D. " The Use of Intelligence Tests in Social Surveys " : J. Maxwell, B.Ed.

A Further Study of Visual Perception : M. D. VERNON. (Cambridge University Press, 35s., pp. 289.)

The author's earlier book, *Visual Perception*, published in 1937, having gone out of print, Miss Vernon has taken the opportunity not only of revising her earlier work, but of adding so much new material as practically to constitute a new book. This deals with the whole problem of perception in an exceedingly wide and scholarly way, and incidentally, while doing full justice to the Gestalt psychology of perception, puts it into its proper place and relationship with regard to the large amount of experiment done on perception both in more recent years and in years long before the Gestalt movement.

The exposition is clear and searching and full references make it probable that this will remain the standard work on perception for advanced students for a long time. We may add that the book includes thirty excellent diagrams and illustrations.

King Solomon's Ring: KONRAD Z. LORENZ, with a Foreword by JULIAN HUXLEY. (Methuen, 15s., pp. 202.)

This is one of the most remarkable books on animal behaviour which it has been the reviewer's pleasure to come upon. Lorenz adopted the method of acquiring birds and animals from birth, or almost from birth, letting them live with him in his own house and trying to learn their language. He obtained an extraordinary influence over many of them and some of his experiments and reports throw light, not only on animal psychology, but on some fundamentals of child psychology and training. In addition, it is a most entertaining and often amusing work, and would make an excellent bedside book for psychologists tired with more precise statistical or experimental works. We must mention the delightful and humorous illustrations scattered freely throughout the book by the author.

To those who happened to see the author in his television programme we may say that he quite failed to do himself justice. Indeed, the whole setting was not appropriate to display adequately the author's marvellous handling of animals.

Survey of Reading Ability: MIDDLESBROUGH HEAD TEACHERS' ASSOCIATION. (Middlesbrough Education Committee, pp. 24, 1s. 0d.)

This survey follows a familiar pattern. The whole of the 11+ age group of the children in Middlesbrough were given reading tests of recognition and comprehension and a sample were given the Sleight non-verbal test of intelligence. The average reading ages were found to correspond closely with the average chronological age and when comparing reading age with mental age only 8·4 per cent. on one test and 11 per cent. on the other were found to be retarded by 18 months or more.

These appear to be very satisfactory figures and very much better than have been found in many places. One must, however, take into consideration the tests used, which were Burt's Graded Work Reading Test and Schonell's Reading Comprehension Test B with the new norms published in *Diagnostic and Attainment Testing*. Most workers have found these two sets of norms very lenient when compared with 1938 standards and, although it is stated in this Report that "Burt's Word List has been found to give only very slightly higher results than Schonell's Word List," it seems likely that Middlesbrough children still have about a year to make up before they reach average pre-war standards of reading efficiency.

A Guide to Mental Testing: RAYMOND B. CATTELL. (Univ. of Lond. Press, 35s., pp. 446.)

This is the third edition of a well-known book. Additional material is added in various sections and a few other points revised. Perhaps it may be regretted that Professor Cattell still omits discussion of individual tests of the Binet type; but no doubt the inclusion of those would expand unduly the size of the volume which, as it stands, is certainly a very useful reference book.

Careers Encyclopaedia: Edited by G. H. CHAFFE; Introduction by LORD KEMSLEY; Foreword by SIR CYRIL BURT. (Avon Press, 25s., pp. 737.)

This is an extremely useful survey of careers for young people. It deals with about 220 occupations "from building to ballet dancing, and from advertising to watch-making." It also includes some valuable information about the educational requirements for various careers.

Sir Cyril Burt sums up with conciseness and breadth of view the arguments for the use of such a book by parents and school teachers, and quite rightly points out the difficulty which psychologists have (in giving vocational guidance) in reference to detailed information about the occupations concerned. This book should do a great deal to meet that need.

OTHER PUBLICATIONS RECEIVED

The mention of a book in this list does not preclude a later review.

Rorschach Interpretation—Advanced Technique: LESLIE PHILLIPS, Ph.D. (Grune and Stratton, Inc., no price given, pp. 385.)

Proceedings of the Fourth International Congress on Mental Health: Edited by ALFONSO MILLAN. (H. K. Lewis, 30s., pp. 386.)

Statistical Methods in Experimentation: OLIVER L. LACEY. (Macmillan Co., $4.50, pp. 249.)

The Younger American Scholar—His Collegiate Origins: ROBERT H. KNAPP and JOSEPH J. GREENBAUM. (University of Chicago Press, 22s. 6d., pp. 122.)

A Clinical Approach to Children's Rorschachs: FLORENCE HALPERN, Ph.D. (Grune and Stratton, $6.00, pp. 270.)

An Introduction to Jung's Psychology: FRIEDA FORDHAM. (Penguin Books, 2s., pp. 128.)

Practical Child Psychotherapy: CURT BOENHEIM, D.D. (Second Edit., Staples, 15s., pp. 184.)

Scuola Secondaria è i suoi problemi: BOLLETTINO BIMESTRALE DEL CENTRO DIDATTICO NAZIONALE PER LA SCUOLA SECONDARIA. (Lire 200, pp. 55.)

Origins of American Scientists: R. H. KNAPP and H. B. GOODRICH. (Univ. of Chicago Press, 56s. 6d., pp. 450.)

Psycho-Analaysis and Child Psychiatry: EDWARD GLOVER, M.D. (Imago Pub. Co., 6s., pp. 42.)

Curriculum Trends in Canadian Education: H. L. CAMPBELL, B.A., M.Ed. (W. J. Gage, no price given, pp. 107.)

Researches and Studies: Univ. of Leeds Inst. of Education, 3s. 6d., pp. 95.)

The Orange Book: E. R. BOYCE. (Macmillan, no price given, pp. 128.)

Improving Reading in all Curriculum Areas: Compiled and edited by WILLIAM S. GRAY. (Univ. of Chicago Press, 24s., pp. 262.)

Samfundet og Ungdommen: Report of the Danish Government Youth Commission, 1945-52. (J. H. Schultz, A/S, pp. 72.)

Social and Economic Studies: Inst. of Social and Economic Research, Univ. College of the West Indies, Jamaica. (9s., pp. 115.)

Social Psychology and Individual Values: D. W. HARDING. (Hutchinson's Univ. Library, 8s. 6d., pp. 184.)

Intelligence Tests for Children (5th edit.): C. W. VALENTINE. (Methuen, 7s. 6d., pp. 83, plus XIII.)

Apparatus for Intelligence Tests for Children: C. W. VALENTINE. (Methuen, 7s. 6d.)

Rorschach's Test: I Basic Processes: SAMUEL J. BECK Ph.D. (George Allen and Unwin, 30s., pp. 227.)

The African Mind in Health and Disease: J. C. CAROTHERS. (World Health Organization, 10s., pp. 177.)

Macmillan's Class-Books for Individual Work: Arranged by E. J. S. LAY. (Book I—Sets I, II, III, IV, 9d. each, pp. 17.)

Adjustment to Physical Handicap and Illness: R. G. BARKER. (Social Science Research Council, N.Y., 12s. 6d., pp. 372.)

The Development of the Idea of God in the Catholic Child: Rev. J. B. MCDOWALL. (The Catholic Univ. of America Press, pp. 144, 10s. 6d.)

Factors in Intelligence and Achievement: Rev. J. A. DRISCOLL. (Catholic Univ. of America Press, pp. 49, 6s.)

Should We All Think Alike?: W. P. Percival. (W. J. Gage, Toronto, pp. 112, 7s. 6d.).

Teacher Education in Canada: M. E. Lazerte. (W. J. Gage, Toronto, pp. 80, 7s. 6d.)

Structure and Aims of Canadian Education: J. G. Althouse. (W. J. Gage, Toronto, pp. 77, 7s. 6d.)

The Stanford-Binet Scale: A. B. Fitt. (New Zealand Council for Educational Research, pp. 32, 3s. 6d.)

A Review of Problems for Research into Bilingualism and Allied Topics: Pamphlet No. 1. (Univ. College of Wales, Aberystwyth, pp. 13.)

Chronicle of the World Health Organization: Vol. 7, Nos. 1 and 4. (World Health Organization, 1s. each.)

The New Way to Better Hearing: V. L. Browd. (Faber and Faber, pp. 252, 12s. 6d.)

Playtime in the First Five Years: Hilary Page. (Geo. Allen and Unwin, pp. 175, 12s. 6d.)

Social Science Studies, Psychology in the Nursery School: N. Wolffheim. (Gerald Duckworth, pp. 140, 9s.)

The Psychology of Adolescence: J. E. Horrocks. (Edited by L. Carmichael) (Houghton Mifflin, pp. 591, 30s. net.)

Direct Analysis: Selected Papers: J. N. Rosen. (Grune and Stratton, N.Y., pp. 179, 22s. 6d.)

Personality Development in Adolescent Girls: Soc. for Research in Child Development. (Child Development Publications—1953, pp. 316, price not stated.)

The Wide Range Readers (Green Book VI): F. J. Schonell and P. Flowerdew. (Oliver and Boyd, pp. 208, 4s. 9d.)

Civilisation, War and Death: Sigmund Freud, Edit. by J. Rickman. (The Hogarth Press and the Inst. of Psycho-Analysis, pp. 115, 8s. 6d.)

A General Selection from the Works of Sigmund Freud: Edit. by John Rickman. (The Hogarth Press, and the Inst. of Psycho-Analysis, pp. 329, 10s. 6d.)

Ship Without Sails: M. Lloyd Turner. (Univ. of London Press, pp. 160, 7s. 6d.)

The Science of Mind and Brain: J. S. Wilkie. (Hutchinson's Univ. Library, pp. 160, 7s. 6d.)

Encyclopaedia of Aberrations: Edited by E. Podolsky, M.D. (State Univ. of New York Medical College, pp. 549, $10.0.)

First Contributions to Psycho-Analysis: Sandor Ferenczi. (Hogarth Press and Inst. of Psycho-Analysis, pp. 338, 30s.)

Trauma, Growth, and Personality: Phyllis Greenacre. (Hogarth Press and Inst. of Psycho-Analysis, pp. 308, 30s.)

Chronicle of the World Health Organization, Vol. 7, No. 2, No. 3. (World Health Organization, 1s. each.)

School and Psychology: John Elmgren. (A Report on the Research Work of the 1946 School Commission, Sweden, 1948, pp. 340.)

Lehrling und Lehre: Franziska Baumgarten. (Rascher Verlag, Zurich, pp. 235.)

Progrès et Incertitudes de L'Education Nouvelle. (Pres. Univ. de France, pp. 213, 11s. 6d.)

An Educational Guidance Project, No. 5. U.P., Allahabad, pp. 82.)

The Acquisition of Word Meanings: A Developmental Study: Heinz Werner and E. Kaplan. (Child Development Pubs., pp. 120.)

The Distribution of Subcutaneous Fat in Childhood and Adolescence: Earle L. Reynolds. (Child Development Publications, pp. 189.)

Fourth Mental Measurements Yearbook: Edit. by O. K. Buros. (Gryphon Press, pp. 830, $18.)

Bibliography of Child Language: Werner F. Leopold. (North-western Univ. Press, pp. 115, 13s. 6d.)

Bodily Physiology in Mental and Emotional Disorders: M. D. Altschule. (Grune and Stratton, N. York, pp. 227, $5.75.)

To Define True Madness: Henry Yellowlees. (Sidgwick and Jackson, pp. 215, 12s. 6d.)

Backwardness in Reading: John Duncan. (G. G. Harrap and Co., pp. 96, 6s.)

The Case Against Psycho-Analysis: Andrew Salter. (Medical Pubs., pp. 179, 10s. 6d.)

The Psychology of Learning: E. R. Guthrie. (Harper and Bros., pp. 310, 24s.)

Social Service and Mental Health: M. Ashdown and S. C. Brown. (Routledge and Kegan Paul, pp. 260, 16s.)

We regret that there was a small error in the advertisement of Gerald Duckworth and Co. in the June number of this *Journal*. The name of the author of "Psycho-analysis and Politics" should have been R. Money-Kyrle, and not R. Mowey-Kyrle.

INDEX TO VOLUME XXIII, 1953